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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON THE TRUE PRINCIPLES OF PROFITABLE HUSBANDRY.

To the Editor of the Farmers' Register.

It is of course, one object of the efforts of every farmer, to increase the profits of his estate, but there is great diversity, both of opinion and practice, as to the best mode of effecting this. The method most acted on in Virginia, or at least in that part of it with which I am best acquainted, the south side of James River, is to lay out any surplus of money which the farmer should happen to have, in the purchase of additional laborers; to make his land produce as much as he can force out of it every year; and when it wears out, to buy another tract if he can. And we are frequently reminded in argument, that it is to this system, that the rich old planters among us owe their estates. But it may be objected that the circumstances in which these were placed, were essentially different from ours—land was in their day fresh and productive, and the price of agricultural products generally so high, that even under their system of farming, industry met with a rich reward. It may also be observed, that although individuals have thriven under this system, the community has suffered—lands have been exhausted by it—population checked—and the accumulation of capital generally prevented. The decrease in the returns of labor, owing principally to the deterioration of the soil in this part of our state, is much greater than is generally supposed; great as it is universally admitted to be. In the days of our forefathers, 3000 pounds of tobacco to a hand, was not, it is believed, a very uncommon crop. At the present day, 1000 pounds are estimated to be fully the average. In the county of Mecklenburg, certainly of medium fertility, through the whole length of which the Roanoke rolls its fertilizing waters, it is computed by a very competent judge, that 750 pounds would equal the average. Some (though a very inadequate) compensation may be found for this, in the increase of the wheat crop. On the whole, however, we cannot conceal from ourselves that under the system heretofore practised, the profits of agriculture in Virginia, have diminished, are diminishing, and are not likely to increase. To what cause then is this result owing? Neither industry nor economy is rare among us. How happens it then, that a climate so benign, capable of rearing the products of almost every other, and having some peculiar to itself, with a soil which nature made productive, and with institutions that stimulate our efforts, by securing their fruits from the capacity of others: how happens it that with all these advantages, our march is retrograde? The answer to this inquiry, I think, may be found in the principles on which we conduct our agriculture, in the fact that we bestow our capital on the increase of labor, and not on the improvement of the soil. It is obvious that the profit of a farmer must arise from the excess of his income over his out-lay or expenditure. Now his expenditure, however diversified may be its items, is all reducible to the two heads of labor and land, and it is perfectly immaterial in this inquiry, whether the human labor he employs be that of hirelings, as at the north, or of his own slaves, as is usual with us in Virginia; for these are a portion of his capital, and the interest of this capital, if converted into money, together with the maintenance of the slaves, is the hire which he pays. Now it has been estimated in the Register, and the estimate is confirmed by the experience of all, it is believed, who have made the calculation, that the expense of cultivating land is with us at least five dollars per acre; but the average value of land in Virginia, certainly in this part of it, falls far short of eight dollars per acre. Its yearly value or rent then is less than fifty cents. We come thus to the remarkable conclusion, that in this comparatively long and well-settled country, we bestow more than ten times as much upon labor as upon land. In New York, it would seem from the estimate in Judge Buel's piece, in the second number of the second volume of the Farmers' Register, that the rent of land was about equal to half the cost of its cultivation: in Flanders the rent is half the gross product. It seems then that as agriculture improves, the cost of cultivation relatively to the value of the land declines. That is, the profits of the farmer go to increase the productiveness of the soil, so that with the same labor, he obtains larger results. Now it is human labor which gives their value to all the other means with which the farmer operates, and it is consequently the most valuable and the most costly of any. That system then which to produce a given result, uses the least of this expensive element of productiveness, is the most profitable. As the improvement of the soil is obviously the most effectual means of doing this, to grudge the sums necessary for improvement, is in the long run, extravagance and not economy. And if we leave speculation, and look at facts, the conclusion will be the same. By referring to Mr. Harder's communication (Farm. Reg. 1st Vol. 9th No.) it will be seen that with labor not costing more than $300, he obtains crops worth more than $2500. Compare this with what we every day witness in our own part of the country, where the expense of tillage is sometimes greater than the whole amount of the crop, and it will go far to explain the problem with which we set out. Economy of human labor indeed, seems to me to be the principle which lies at the foundation of all good husbandry, and which will explain every difference between a well and ill managed farm. Be consistent and systematic in the application of this principle, and it will compel you to have good fences, to procure the best tools, and a plentiful supply of strong and serviceable horses and oxen for draught and the plough; and the change thus produced is one which does not merely recommend itself to the proprietor—to the eye of taste and feeling, the sight of a beautiful and highly cultivated country, is one of the most delightful which can be presented. To look upon "pastures clothed with flocks and valleys covered over with corn," must excite in the patriot and philanthropist, emotions of the liveliest pleasure; while the perpetual contemplation of increasing sterility, seems calcu-

lated to harden the heart, and to contract all its feelings into the narrowest selfishness. Looking then at all its consequences, it may well be questioned, whether we are not responsible for the desolation we have produced, whether we have the moral right to strip the soil of the magnficent forests which have waved over it for centuries, and to leave it covered in their stead, with broomstraw, dock and mullen, and reddened with galls and channelled with gullies.

A. B.

[The writer of the foregoing communication, has exposed to view, though hastily and slightly, one of the main causes of unprofitable tillage in Lower Virginia. It is to be regretted that he did not extend his remarks, and exhibit more of the consequences, which (may not only be inferred from his undeniable positions, but) are matters of general experience. It is undoubtedly true that we generally employ more of human labor in tilling our farms than sound views of profit would direct—in some cases (and not very rare cases) the net hire of the slaves, or the interest on the money they could be sold for, would amount to double the net product of the crops they make. No man in his proper senses would employ labor in this wasteful manner, if he had to procure it by hire or by purchase —but his owning the slaves in no degree effects the estimate, or lessens the loss he thus incurs. The truth is, that the extent of our employment of slave labor is very seldom directed by calculations of profit or loss, or regulated by the demands of the farm. We generally hold the slaves that have been derived from inheritance or other sources, until the death of the owner requires their distribution, or his necessities compel the sale of a portion of them, to maintain the balance —and almost never by a proper consideration of how many laborers and of what kinds, the proper cultivation and judicious management of a farm require. According to chance, to the necessities, and to the feelings of the farmer, and not according to any sound or mature estimate of the stock wanted for his farm, the amount of his slave labor is regulated—and wherever the proportion is very different from what a proper estimate would direct, there can be no doubt that the farming operations so conducted must be subject to certain and heavy loss.]

ON TURNING IN GREEN CROPS FOR MANURE.

From the Transactions of the Essex (Mass.) Agricultural Society for 1834.

The Committee on Turning in Green Crops for Manure, report:

That there are many different sorts of vegetable substances, when deprived of their living property, by undergoing the process of decomposition, that soon become proper for the nutrition and support of new plants and fit for being applied as manure. —Their reduction to this state is greatly promoted by their being exposed to the full influence of the air, moisture, and a suitable degree of heat. And it may be remarked that in vegetable productions the changes are less rapid than those of the animal kind, and probably much more varied according to the various states and textures of the particular substances, and it is obvious from numerous facts and circumstances that the more luxuriant and juicy vegetables are much more readily decomposed than such as are dry. Hence it is, that fresh vegetable substances are much more quickly converted to that state of decay which is suitable for supplying vegetable nourishment, than straw, or hay and other dry materials of the same nature. And among substances of the latter description, buck-wheat has been recommended by English and American farmers as the most economical and convenient for this purpose. And the truth of these recommendations has been well illustrated by an experiment recently made of it as a manure by Daniel P. King, Esq. on his farm in Danvers. Mr. King in a written communication made to your committee of the last year, dated September 1832, says, "I have this season commenced the experiment of ploughing in a green crop for manure, the details of which, I beg leave to communicate. I have been encouraged to make the attempt by favorable results in turning in Roman wormwood and other weeds, after harvesting crops of rye, and I have been, besides, actuated by a desire of answering, so far as I might be able, the wishes of your Society, which has, for several years, offered a liberal premium for the "most satisfactory experiment of turning in green crops as a manure," and which has never within my knowledge been claimed.

Buckwheat has been recommended by foreign as well as American farmers, as the most economical and convenient plant for this purpose. The cost of seed is trifling, it thrives on sterile ground, requires but a short season for its growth, produces a heavy crop, which, when buried, readily decomposes.

July 10th. One acre of level ground, the soil of which is a sandy loam, almost exhausted, for it had been in grass five years, without dressing, and from which a crop of less than five hundred weight of hay had just been taken, was ploughed, and the sward well turned under. The next day one bushel and a half of buckwheat, *Polygonum Tartaricum*, was sown on the ground, broad cast, and well harrowed and rolled. I used no manure, as I understand the object of the experiment to be to ascertain whether, under some circumstances, a green dressing may not be substituted for other fertilizing substances. The season, although cold, has not been very unfavorable for the growth of plants of this description. In less than a month from the time of sowing, the buckwheat began to bloom; it was particularly exuberant, wherever by accident, a small quantity of manure was dropped, which has satisfied me and others who have seen the crop, that a moderate dressing would have greatly increased the product. Till the sward had begun to decompose, and thus afforded more food for the plants, the prospect was not very promising: three quarters of the growth was in the second month.

Sept. 6th. The buckwheat white with its flowers, and still growing, but getting into the milk, and to anticipate the ripening of the seeds was rolled and ploughed in; a revolving cutter was used to prevent clogging, and the old sward was so well rotted that there was little difficulty in the operation of ploughing, and the crop was thoroughly buried."

Mr. King in a subsequent communication to your committee, dated August 23, 1833, says, "in

my communication addressed to the committee of the last year, which has been transmitted to you, I detailed my process of raising and ploughing in a crop of buckwheat for manure, on an acre of land. The last spring the ground was so well pulverized that it was ploughed with facility, and after harrowing and furrowing it was planted with Indian corn, in hills, the same quantity and kind of manure being used, and the same method of cultivation pursued as in other pieces of corn growing in the same field.

The operations of planting and hoeing, on this experimental acre, have been easier than on the other land which had not been once planted, and the crop has better sustained the severity of the drought, to which all lands, in this vicinity, the present summer, have been exposed. The ground will be as mellow, and as well prepared for laying down with grass seed as it is commonly after planting for two years. I submit my experiment for your consideration. On viewing the field (to which I invite your attention) you will determine whether my process has been in any degree satisfactory, and whether a green crop may, under such circumstances be advantageously employed for manure."

Pursuant to the request, contained in Mr. King's last communication, your committee on the 27th of August last, viewed the ground upon which Mr. King's experiment had been made.

They found it remarkably well pulverized. and the growing crop of corn thereon was in a much more promising and flourishing state, and much better sustained the severity of the drought, to which all lands in that vicinity were then exposed, than the crops of corn which were then growing on the contiguous ground of Mr. King, of a similar soil, and which had been cultivated and manured in the ordinary manner.

The committee award to Mr. King, who was the only applicant to them for a premium, the sum of twenty dollars.

D. CUMMINS, *Chairman.*

VOLCANIC ISLAND OFF THE SOUTH COAST OF SICILY.

From the [London] Penny Magazine.

Most of our readers will probably remember the accounts published in the newspapers some time since, of a volcano that suddenly rose from the bosom of the sea, opposite to Sicily, and which, after having attained the size of a considerable island, was rapidly washed away by the waves of the sea from which it rose, and at length totally obliterated.

Through the kindness of John Wright, Esq., an intelligent merchant of Glasgow, who has resided long in Sicily and Naples, we are enabled to give a description of this extraordinary island. Mr. Wright happened to be in Sicily at the time the sub-marine eruption took place, (on the 12th of July, 1831,) and with laudable curiosity determined to repair to the spot. To this end he hired a boat on the 24th of August, (forty-three days after the first appearance of the island,) at Sciacca, on the southern coast of Sicily, which was the town nearest to the volcano, and with an artist, who made drawings on the spot, a physician, and some other Sicilian gentleman, went in quest of the object that was then exciting so much astonishment and terror.

The party left the shore of Sciacca at nine o'clock in the evening. There was a beautiful bright moon, and they were further favored by a gentle breeze blowing from land in the direction of the island. After some hours Mr. Wright and his companions went to sleep, leaving the easy care of the boat to the sailors. They were awakened a little before sunrise by explosions that warned them they were near the volcano, and rising, they saw, at a short distance, two hills surmounted by a column of smoke. The curious island of Pantellaria, which has evidently been thrown up in the same manner by a sub-marine eruption, though it is now inhabited and partially cultivated, was seen in the distance to the west. They calculated that they had sailed about thirty-six miles, and that the new island was about equi-distant from Sciacca and Pantellaria. It had arisen from a sand bank, which was previously covered (though not with deep water) by the sea, and well known to mariners by the name of "Nerita." This sand bank itself, which extends for some distance, is probably the result of some anterior volcanic convulsion.

Mr. Wright and his friends proceeded eagerly towards the island, when, just as they were within a few oars' length of it, the sun rose in all his glory behind the dark crater, revealing its form, and shining through the dense smoke with singular effect. They began their examination at the north west of the volcano, where it presented the form of a round hill, rising about 120 feet above the level of the sea. They were deterred from a close approach by a thick cloud of white smoke which issued from the side of the hill on a level with the sea. They rowed the boat round the island, keeping about twenty feet from it, until they came to the north east point, where they found that the island was some feet higher than at the part previously examined, and that there was a piece of flat sandy shore which seemed to afford a good landing place. As, however, nobody had hitherto set foot on this new production of nature, some apprehensions as to the safety of so doing, or whether they would not be swallowed up, were entertained by the Sicilians. After some minutes of hesitation one of the sailors, encouraged by Mr. Wright, leaped ashore and found tolerably firm footing. Mr. Wright immediately followed him. The sailor, who had proved himself the most adventurous of his comrades, was yet reluctant to go to any distance from the boat, or to ascend the side of the volcano. Mr. Wright advanced a few steps alone, and perceiving some bright yellow stones that had very much the appearance of gold, he picked up some of them, and cried out, "run! run! my friends! here is gold! here is gold!" This temptation was irresistible—every man left the boat; or, to use the words of one of the Sicilian gentlemen of the party, whose memoranda are before us, they "all leaped on shore, like so many devils careless of life, through the avidity to obtain part of the treasure." (Here we may as well remind our readers that the Sicilians and Neapolitans are commonly inclined to believe the volcanoes sometimes throw out gold. In No. 2 of the 'Penny Magazine,' a communication from a correspondent, who was at Naples at the time, informs us that the Neapolitans collected some of the matter ejected by Mount Vesuvius during the

great eruption of 1822, expecting to find gold in it.) Mr. Wright's companions were soon undeceived; but finding that they nowhere sank much deeper than the ankle in the sandy soil, they readily followed his example, and climbed up to the ridge of the island at the part where it was lowest. Having reached this point with some difficulty, they stood on the edge of a crater that was flanked on either side by a cone or peak of superior elevation. The form of the crater was very irregular—within it, and forty-five feet below its lip or edge on which they stood, and nearly on a level with the surface of the sea, they saw two small lakes of boiling water. One of these lakes was about one hundred and fifty feet in circumference, the other not more than thirty. In the first the color of the water was a light yellow, in the second a reddish yellow; they bubbled here and there and emitted vapor.

The master of the boat (a Maltese) boldly climbed to the top of the highest cone—an exploit not performed without danger, as on that part the island descended almost perpendicularly to the sea, whose waves had already begun to destroy it, and occasionally carried away large masses at a time.

Mr. Wright and his party returned to the strip of beach where the boat was secured, and were amusing themselves by examining and collecting the curious ashes, lapille, and stones which were there deposited, when a rumbling noise and smoke, accompanied by a most pungent sulphureous smell, arose from the crater, and compelled them to embark. They rowed round to the south eastern point of the island, where they found a strip of beach like that which they had left, and lying on it, half dead and stupefied, a fine large *pesce-spada*, or sword fish. This they secured and carried back with them to Sciacca, where they found it weighed upwards of sixty pounds English. The fate of the fish must have arisen from its coming too near the hot and contaminated water which on all sides surrounded the island to a greater or less distance. Indeed, when the party started from this point to continue the circumnavigation of the island, they were obliged to keep nearly a mile at sea, to steer clear of a new sub-marine crater which was forming there, the eruptions from which had changed the color of the waves from blue to deep yellow, and, for the space of half a mile, made them foam and roar in a fearful manner. Even at the distance at which they kept their boat, the air was so charged with sulphur that it almost suffocated them. As they doubled this, the south west extremity, they saw immense clouds of smoke, now black, now white, rising as it were from a rent in the bosom of the sea, and attaining an elevation of 2000 feet.

Having gone entirely round the island, they ascertained that its form was circular, and that it was then about two miles in circumference, but evidently diminishing every day. Besides exciting *their* curiosity, it should seem that the novel appearance of this volcano had attracted the curiosity of a turtle dove, for as they landed to examine one point, a bird of that gentle species saluted them from the summit of the island with its melancholy note, and then disappeared.

On the 27th of October, 1831, the steam-packet "Franceso Primo" left Naples expressly to visit this volcano, which the Neapolitans had named "L'Isola Ferdinandea." Among the passengers was an English gentleman, who made some drawings and measurements, and described the island as it then was. From an examination of these, it results that during only two months which had elapsed since Mr. Wright's visit, the island had been reduced to one-seventh of its circumference as measured at that visit. Peaks and elevations had sunk into the sea,—there only remained one, which was much lowered, and no longer retained the appearance of a volcanic crater. This rose in the centre of the island; it was an irregular cone in shape, and composed of fine, heavy, black sand, and very friable scoriæ. All the rest of the island was a plane whose level scarcely surmounted the superficies of the sea. With the least wind the waves washed over all this level part, which, like the hill, was composed of black sand and scoriæ, mixed here and there with fragments of lava that seemed to contain a good deal of iron. No smoke then issued from any part of the island, but wherever the visiters dug a little in the plain, a strong heat with smoke escaped. There remained, however, a small lake, the waters of which seemed, from the steam resting on their surface, to be still boiling. These waters had changed their color from yellow to a brownish black. They were ascertained to be sea-waters, mixed with sulphur and other volcanic components, from which they were easily disengaged. In a direction opposite to this small lake, and at the distance of a few feet from the shore of the island as it then was, the sea for a certain space was covered with a bright blue oleous fluid, which produced precisely the same tranquillizing effect that oil does when thrown upon the waves. This fluid was, in all probability, *petroleum*, like that which is found floating on the surface of the Bay of Naples, near the roots of Mount Vesuvius, and in the neighborhood of most volcanoes.

The western side of the central mount was covered with volcanic ashes and saline efflorescence, the white color of which contrasted in a curious manner with the dingy black hue of all the rest of the cone. As the party from the steam-boat ascended the mount, they found two wooden boards stuck deeply in the sand. On the first of these were recorded the names of two members of the French Academy, Messrs. Jonville and Constant Prevot; and on the second the name of an Austrian brig and the name of her commander, who had all visited the island since Mr. Wright's expedition. It was evident to every body that the flat part of the island was rapidly disappearing, and that when the sea had destroyed this, the mount remaining exposed to the direct fury of the waves could not, from the lightness and friability of the materials which composed it, long resist their attack. It was therefore concluded that in a few months the island would no longer exist; and in fact, a very few months afterwards, when Mr. Wright sailed across this part of the Mediterranean, the sea between Sciacca and Pantellaria was perfectly clear, and there remained not the least vestige of the island. He, however, had not the opportunity of examining to what degree the detrition of the volcano had affected the sandbank beneath.

Whichever way the traveller turns on the coasts of Sicily he meets with melancholy evidences of the tremendous effects of volcanic action. The city of Sciacca itself, from which Mr. Wright set

out to visit the new volcano, is surrounded by hot springs, petroleum pits, and caverns of sulphur which still smoke; and about five centuries ago it was entirely destroyed by an eruption. Though the town has been renewed, it has never recovered its former prosperity. Its population, which was 60,000 at the time of the awful catastrophe, now scarcely amounts to 18,000.

ON THE BREEDING, REARING, FATTENING, AND GENERAL MANAGEMENT OF NEAT CATTLE.

Extracts from the last edition (1833) of the "Complete Grazier."

[Continued from page 213, Vol. II.]

On the treatment and rearing of Calves.

The importance of forwarding calves to maturity with the greatest possible advantage to the full developement of their natural qualities, has necessarily called forth all the ingenuity of the most expert breeders. The most approved, and certainly the best general plan, is to adhere as closely as possible to nature; but various modes of treatment having been adopted in different counties, we shall endeavor to bring into one view every useful fact connected with this subject.

After the calf is produced, the cow uniformly shows an inclination to clean its skin, by licking off, with her tongue, the slimy matter adhering to the young animal. To facilitate this object, it is a frequent practice to throw a handful of common salt over the calf, or to rub a little brandy on it, in case she should disown it, which will cause the dam speedily to perform this necessary duty; and, about an hour after the birth, half a pint of lukewarm gruel is commonly given to the calf, in order to prevent it from taking cold, in lieu of the *beestings*, or first milk drawn from the cow. But however commendable may be the practice of administering gruel—and its use, for the purpose recommended, is not meant to be denied—it should yet be recollected that the beestings is provided by nature as the first aliment of the newly born animal; that it is a strong and viscid fluid of a peculiarly nourishing quality, and therefore appears as if intended for the very purpose of early invigoration. The practice which prevails, of depriving the calf of this nourishment is, therefore, objectionable; nor is there any sound reason why it should not be given, notwithstanding the administration of gruel.

There are two modes of feeding calves:—one is, to permit them to run about with the parent cow the whole of the first year; the other mode is to wean them when about a fortnight old, and bring them up by hand.

The former expedient is generally allowed to be productive of the best cattle, and is adopted in those counties where fodder is abundant and cheap: in others, where it is found prudent to reserve a portion of the milk, the following plan is pursued. From the time the calves are dropped till they are able to support themselves, they are allowed to run in the manner abovementioned, but they are prevented from sucking by means of a small piece of leather having little sharp iron spikes fixed upon the outside, which is tied on the upper part of the calf's nose in such a manner as to allow it to feed upon the grass without restraint. Hence, as often as the animal attempts to suck, this instrument pricks the cow, and prevents her from letting the milk flow till the arrival of the milk-maid, who removes the muzzle; so that while she strips two of the teats, the calf sucks the other two, and after the process of milking is completed, the muzzle is replaced on the calf's nose in the manner above mentioned.

Whether calves are designed to be raised for breed, labor, or feeding, care should be taken that they have a sufficient supply of good pasture; because, if the latter be scanty at first, they rarely, if ever, attain to large growth. The best time for weaning them is, therefore, about that period of the year when the young grass acquires enough succulence both to entice the appetite and to afford complete nourishment without the aid of other food. Calves which are dropped in October or November will thrive greatly by the nourishing pastures into which they may be turned in the ensuing spring, if allowed to suck and properly sheltered throughout the winter; but the milk is too scarce at that season to be commonly bestowed on them; and winter-wearied calves seldom arrive to much perfection.

Various plans have been suggested, and tried with considerable success, for rearing calves without any, or at least with a small quantity of milk. The time of weaning them varies, from one fortnight till they are seven weeks old; but the latter period is preferable, on account of the weak and tender state of the calves, if separated from the dam at an earlier age. In several counties of England, calves, on being taken from the cows, are, with great pains, taught to drink* skimmed milk, in a lukewarm state; for either extreme of heat or cold is hurtful to the beast, and not unfrequently produces fatal consequences; about twelve weeks after which, for three or four weeks, they are fed with lukewarm milk and water. Small wisps of fine hay are then placed within their reach, in order to induce them to eat. Towards the end of May they are turned out to grass, being taken in a few nights, when they have tepid milk and water given them; which is usually continued, though gradually in smaller proportions, during the last month, till they are able to feed themselves, when they totally disregard it: care, however, should be taken that the grass is short and sweet, and by no means rank or sour. Indeed, a spirited American agriculturist† is of opinion that calves taken from the cows are much better in a pasture without water than in a pasture of equal goodness

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* Of the patience and attention requisite in teaching calves to drink, a very inadequate idea only can be formed by those who have never witnessed this tedious process. When the animal has fasted two or three hours, the first and second finger of the right hand, being previously well cleaned, are presented to its mouth; of these it readily takes hold, sucking very eagerly. In the mean time, a vessel of lukewarm milk is placed, and supported by the left hand, under the calf's mouth, and, while it is sucking, the right hand is gradually sunk a little way into the milk, so that it may lap a sufficient quantity without stopping its nostrils, which will necessarily compel it to cease, from want of air. Should, however, either from accident or from too sudden precipitation of the hand into the milk, the calf let go its hold, the attempt must be repeatedly renewed till it is crowned with success.

† Mr. E. L. Hommedieu. Transactions of the Agricultural Society of New York.

with water. The reason he assigns, (with which however, we can by no means coincide,) is, that, when indulged with water, they drink too much to supply the want of milk; whereas, when deprived of water, they are forced to eat grass, containing some moisture, and soon learn to allay their thirst, by eating before the dew is dissipated, and on that account eat more than if they could go to water.

In the county of Suffolk, calves are usually weaned soon after Christmas; when they are fed with lukewarm skimmed milk and water, having bran or oats in it, and some very sweet hay by them, till the grass is ready; though if the farmer have carrots, these form an excellent article of food, and render the use of oats unnecessary. About two gallons of milk daily are sufficient for the support of a calf until he begins to eat. It should be given regularly at the same hours; and he should be kept as quiet as possible, as rest is found to materially promote his growth.

In Ayrshire, calves intended to be reared for dairy cows are fed on milk for the first four, five, or six weeks, and are then allowed four or five quarts of new milk at each meal, twice in twenty-four hours. Some never give them any other food when young except milk, and lessen the quantity when they begin to eat grass, or other food, which they generally do when about five weeks old, when grass can be had; and the milk is wholly withdrawn about the seventh or eighth week. But if reared in winter, or before the grass rises in spring, they must be longer supplied with milk, as a calf will not so soon learn to eat hay or straw, nor thrive so well on them alone, as it will on pasture. Others feed partly with meal mixed in the milk after the third or fourth week; or gradually introduce some new whey along with the meal, and afterwards withdraw the milk altogether. Hay-tea, linseed jelly, treacle, &c. are also sometimes used with advantage; but milk, when it can be spared, is by far the best as well as the most natural food.*

Another mode of rearing calves has been suggested by his Grace the late Duke of Northumberland, the design of which is to render the use of new milk unnecessary, while the expense is reduced in the proportion of two-thirds. It is effected in the following manner: let half an ounce of common treacle be well mixed with a pint of skimmed milk, then gradually add one ounce of finely powdered linseed oil-cake, stirring it till the mixture be properly incorporated, after which it is to be added to the remainder of a gallon of milk; and the whole, being made nearly of the temperature of new milk, may then be given to the animal: after a short time, the quantity of pulverized oil-cake may be increased. This method is said to have been advantageously adopted; but Lord Egremont has used linseed jelly, in the proportion of one pint to a gallon of skimmed milk, without treacle, and it did not answer.†

An infusion of hay, or sometimes of pea-haulin, called indiscriminately hay-tea or hay-water, has been also applied to the purpose of rearing calves with the smallest quantity of milk. In order to make this infusion, such a portion of fine, sweet hay, cut once or twice, is put into a small earthen vessel, as will fill it, on being lightly settled with the hand. The vessel is then filled with boiling water, and carefully closed; at the end of two hours a brown, rich, and sweet infusion will be produced, not unlike alewort, or strong tea, which will remain good for two days, even during summer, and which is to be used in the following manner.

At the end of three or four days after a calf has been dropped, and the first passages have been cleansed, as already noticed, let the quantity usually allotted for a meal be mixed, consisting, for a few days, of three parts of milk, and one part of the hay-tea; afterwards the proportions of each may be equal; then composed of two-thirds of hay-water and one of milk; and, at length, one-fourth part of milk will be sufficient. This preparation (the inventor of which was, many years since, honored with a gold medal by the Dublin Society of Arts) is usually given to the calf, in a lukewarm state, in the morning and evening; each meal consisting of about three quarts at first, but gradually increasing to four quarts by the end of the month. During the second month, beside the usual quantity given at each meal, (composed of three parts of the infusion, and one part of milk,) a small wisp or bundle of hay is to be laid before the calf, which will gradually come to eat it; but, if the weather be favorable, as in the month of May, the beast may be turned out to graze in a fine, sweet pasture, well sheltered from the winds and sun. This diet may be continued till towards the latter end of the third month, when, if the animal graze heartily, each meal may be reduced to less than a quart of milk with hay-water; or skimmed milk, or fresh butter-milk, may be substituted for new milk. At the expiration of the third month, the animal will scarcely require to be fed by hand; though, if this should still be necessary, one quart of the infusion (which during the summer need not be warmed) will be sufficient for a day.

The economical mode above detailed has been adopted in some counties of England, with the addition of linseed-cake finely pulverized and boiled in the hay-tea *only*, to the consistence of a jelly, without employing any milk in the mixture;* and, as so many excellent artificial grasses are now cultivated for the feeding and fattening of cattle, we conceive that an infusion of any one or more of them would be found more nutritious than if it were prepared from the promiscuous mixtures of grass usually occurring in common hay.

In Devonshire, the rules commonly followed in rearing calves are nearly as follows:—The greatest number are usually dropped between Candlemas and May, and some much later; but the most

* Aiton's Dairy Husbandry, Chap. I. Sect. IV.

† See the Agricultural Survey of Sussex, p. 262.

* In the "Letters and Papers of the Bath and West of England Society," Vol. V. we have a singular instance of success in this mode of rearing, by Mr. Crook. In 1787, he bought three sacks of linseed, value £2 5s., which lasted him three years. One quart of seed was boiled in six quarts of water, for ten minutes, to a jelly, which was given to the calves three times in the course of the day, mixed with a little hay-tea. Thus he was enabled to rear in 1787, seventeen calves; in 1788, twenty-three; and, in 1789, fifteen, without any milk at all. And he states, that his calves throve much better than those belonging to his neighbors which were reared with milk. Pot-liquor has also been found an excellent substitute for milk; and it is remarkable, that the great ox bred by Mr. Dunhill (already mentioned in the Introductory View) was chiefly reared on it.

experienced breeders prefer the earliest. They are permitted to suck as much as they like, three times a day for the first week, after which they are suckled by hand, and fed with warm new milk for three weeks longer. They are then fed, during the two following months, twice a day, with as much warm skim milk as they can drink—in which some feeders mix a small portion of finely pounded linseed-cake, or meal; after which the meals of milk are gradually abated, and at the end of four months they are wholly weaned from milk, and left to themselves at pasture.

In the northern counties of England, it is a common practice to give the calves equal parts of milk and sweet whey, made lukewarm; but, as this mode often produces scouring, or looseness, we think the following method, which was a few years since communicated to the public by a spirited and experienced breeder, is greatly preferable. For the first four or five weeks he fed them regularly, but oftener than is usually done, with new and skimmed milk; at the end of which time his calves were gradually taught to drink strong water gruel, consisting of equal parts of bean or oat-meal, mixed with one-half of buttermilk, and carefully mixed with the gruel after the latter is removed from the fire. This method of treatment he is stated to have pursued with great success for many years; his calves being strong and healthy, while every thing that could tend to retard their growth was effectually prevented.

In the county of Norfolk, calves are fed with skimmed milk, in which is mixed a little wheaten flour; they have also chopped turnips in a trough, and some hay in a low rack. As soon as these animals learn to eat turnips freely, they are no longer supplied with milk, those roots, with the addition of a little hay, furnishing them both with food and drink. The period of raising calves in the above mentioned county is from Michaelmas to Candlemas; but the time of feeding them wholly with turnips varies, according to circumstances or accident. Where there are older calves that have been accustomed to these roots, the younger ones soon acquire the method of breaking and eating them, by picking up the fragments left by the former.

Towards the month of March, those which are first reared, are turned out among the fattening bullocks during the day, and are sheltered in the night; though, if the weather prove favorable, they are in a few days turned out altogether. In the succeeding summer they are kept in clover, or other luxuriant grasses, and the following autumn, are sufficiently strong to stand in the straw or fold-yard. This circumstance is considered as a chief advantage to be derived from rearing calves early in the season; as those which are raised during the spring require two years' nursing.

The subsequent method of raising calves by Mr. William Budd, of Boston, in America, which obtained the prize from the Agricultural Society of Massachusetts, we give in his own language, extracted from his communication to that Society.

"Take the calves, when three days old, from the cows, and put them into a stable by themselves; feed them with gruel, composed of one-third barley, two-thirds oats, ground together very fine, sifting the mixture. Each calf is to receive a quart of gruel morning and evening, and to be made in the following manner: to one quart of the flour add twelve of water, boil the mixture half an hour, let it stand until milk-warm. In ten days, tie up a bundle of soft hay in the middle of the stable, which they will eat by degrees. A little of the flour, put into a small trough, for them occasionally to lick, is of service. Feed them thus till they are two months' old, increasing the quantity. Three bushels of the above mixture will raise six calves."

Mr. Clift, of the New York Agricultural Society, takes the calf from the cow at two or three days' old; he then milks the cow, and while the milk is warm, teaches the animal to drink by holding his head down into the pail; if the calf will not drink, he puts his hand into the milk, and a finger into the mouth, till the beast learns to drink without the finger. After he has been fed with new milk for a fortnight, the cream is taken off the milk, with which an equal or larger portion of thin flax-seed jelly is mixed, and the whole is given milk-warm. Thus, as the spring is the most favorable season for making butter, he is enabled, during the six or seven weeks the animals are kept previously to weaning, to make as much butter as they are worth; a practice which merits the attention of our English farmers, to whom it will afford a very essential saving, particularly in those counties where butter forms a chief article of manufacture.

In the rearing of calves, much, however, depends on the regularity of feeding them; the common practice is, to supply them with food twice in the day, in the morning and at evening, when they generally receive as large a quantity as their craving appetites can take. Hence the digestive organs are necessarily impaired, and numerous animals either become tainted with disease, or perish from the inattention of their keepers; whereas, by feeding them thrice in the day, at equidistant intervals, and allowing sufficient room for exercise, (when they are not intended to be fattened,) they will not only be preserved in health, but they will also greatly improve in condition.

Whatever food be allowed to young calves, care should also be taken not to change it too suddenly. A calf must have attained a certain degree of strength before it can dispense with the food most natural to its age and thrive without the aid of milk; it should always therefore be allowed as long as possible; but even when that has been withdrawn, and the animal has begun to eat grass, still the substitutes that had been employed in lieu of milk should be partly continued until his appetite prefer the pasture. It is a common notion that provided young stock acquire size, their condition is immaterial; and, after the first winter, they are generally turned into the toughest pasture, and kept during the following winter on straw with, perhaps, a little indifferent hay. This, when they are intended to be sold to the fatting grazier, may be the most profitable mode, and, in some situations, it is the only one that can be adopted; but when they are meant to be reared, for the breed, it is absolutely requisite, as the only means of bringing them to perfect maturity, and improving their qualities, that they should be kept on good pasture during the summer, and allowed roots with some sound hay in the winter, and green food in the spring: a contrary mode, though the most economical, is decidedly disadvantageous; for the worst breed will ultimately be improved by good feeding,

while the best will degenerate under a system of starvation.

With regard to those calves which are intended for the draught, it will be advisable to accustom them, while young, to be handled and stroked, and tied up to the manger; as they may, when they come to be broken in, be handled with less apprehension of danger.

The best time for castrating male, or spaying female calves, undoubtedly is when they are fifteen or twenty days old, as at that time there is least danger, provided they be in full health; though this operation is in some places, particularly in Scotland, deferred till the animals are three years old. Formerly this object was effected by tying a strong cord round the small part of the testicles, near the body, till these became completely dead, when they were either suffered to remain till they dropped spontaneously off, or were cut off, and the animal was perfectly castrated. Modern ingenuity, however, has devised a better means of eradicating the testicles, by excision; but, as this cannot be effected without resorting to an experienced farrier, or cow-doctor, we decline to give any directions respecting an operation which, if unskilfully performed, must prove greatly injurious to the animal. Let it, therefore, suffice to state, that, after the calves are castrated, or spayed, as the difference of sex may require, great care ought to be taken that the wounded part be not exposed to the air, which might otherwise occasion loss of blood or other accidents. For the first two or three days, the animals should be kept quiet and tolerably warm, and be dieted according to their weakness; but they ought not to be allowed two much drink till they are perfectly recovered, after which time they may be treated in the usual manner.

[To be continued.]

[The following extracts relate to the management of draught horses and other branches of rural economy in a country (Nassau in Germany) where habits and circumstances are very different from our own. If the reader should thence derive no useful information, he will at least be amused by the originality of thought and expression exhibited by the author. In explanation of some parts of the management of swine, it may be necessary to mention that the cultivated lands of Nassau are not fenced, and that it is required to guard the stock to restrain their depredations, instead of each proprietor being compelled to secure his fields from their attacks, as with us.]

ON HARNESSING DRAUGHT HORSES.

From "Bubbles from the Brunnens [Medicinal Springs] of Nassau."

* * * * Many years have elapsed, since I first observed that, somehow or other, the horses on the continent manage to pull a heavy carriage up a steep hill, or even along a dead level, with greater ease to themselves than our English horses. If any unprejudiced person would only attentively remark with what little apparent fatigue three small, ill-conditioned horses will draw, not only his own carriage, but very often that huge, overgrown vehicle the French *Diligence*, or the German *Eil-wagen*, I think he would agree with me; but the whole equipment is so unsightly—the rope harness is so rude—the horses without blinkers look so wild—there is so much bluster and noise in the postillion—that, far from paying any compliment to the turn-out, one is very much disposed at once to condemn the whole thing, and, not caring a straw whether such horses be fatigued or not; to make no other remark than that, in England, one should have travelled at nearly twice the rate with one-tenth of the noise. But neither the rate nor the noise is the point—our superiority in the former and our inferiority in the latter cannot be doubted. The thing to account for, is, how such small weak horses, do actually manage to draw a heavy carriage up-hill with so much ease to themselves. Now, in English, French, and German harness, there exists, as it were, three degrees of comparison as to the manner in which the head of the horse is treated; for, in England, it is elevated or borne up, by what is called the bearing-rein—in France, it is left as nature placed it (there being to common French harness no bearing-rein)—and in Germany, the head is tied down to the lower extremity of the collar, or else the collar is so made that the animal is by it deprived of the power of raising his head. Now passing over, for a moment, the French method, which is in fact, the state of nature, let us for a moment consider which is better—to bear a horse's head *up*, or to pull it *downwards*, as in Germany.

"In a state of nature, the wild horse, as every body knows, has two distinct gates or attitudes. If a man, or any still wilder beast, come suddenly upon him, up goes his head; and as he first stalks and then trots gently away—with ears erect, snorting with his nose, and proudly snuffing up the air, as if exulting in his freedom—as one fore leg darts before the other, we have before us a picture of doubt, astonishment, and hesitation, all of which feelings seem to rein him, like a troop-horse, on his haunches; but attempt to pursue him, and the moment he defies you—the moment, determining to escape, he shakes his head, and lays himself to his work—how completely does he alter his attitude!—That instant down goes his head, and from his ears to the tip of his tail there is in his vertebræ an undulating action which seems to propel him, which works him along, and which, it is evident, you could not deprive him of without materially diminishing his speed. Now, in harness, the horse has naturally the same two gaits or attitudes, and it is quite true that he can start away with a carriage either in the one or the other; but the means by which he succeeds in this effort, the physical powers which he calls into action, are essentially different: in the one case he works by his muscles, and in the other by his own dead, or rather living, weight. In order to grind corn, if any man were to erect a steam-engine over a fine strong running stream, we should all say to him, "Why do you not allow your wheel to be turned by cold water instead of hot? Why do you not avail yourself of the *weight* of the water, instead of expending your capital in converting it into the power of steam? In short, why do you not use the simple resource which nature has presented ready made to your hand?" In the same way, the German might say to us, "We acknowledge a horse can drag a carriage by the power of his muscles, but why do you not allow him to drag it by his weight?"

'Let any one observe a pair of English post-horses dragging a heavy weight up a hill, and he will at once see that the poor creatures are work-

ing by their muscles, and that it is by sheer strength that the resistance is overcome; but how can it be otherwise?—their heads are higher than nature intended them to be even in *walking* in a state of liberty, carrying no weight but themselves; the balance of their bodies is, therefore, absolutely turned *against*, instead of leaning in favor of, their draught; and if my reader will but pass his hands down the back sinews of our stage-coach or post-chaise horses, he will soon feel (though not so keenly as they do) what is the cruel and fatal consequence. It is true, that, in ascending a very steep hill, an English postillion will occasionally unhook his bearing-reins; but the jaded creatures, trained for years to work in a false attitude, cannot in one moment get themselves into the scientific position which the German horses are habitually encouraged to adopt. Besides this, we are so sharp with our horses—we keep them so constantly on the *qui vive*, or, as we term it, in hand, that we are always driving them from the use of their weight to the application of their sinews. That the figure and attitude of a horse working by his sinews are infinitely prouder than when he is working by his weight—(there may exist, however, false pride among horses as well as men)—I most readily admit; and, therefore, for carriages of luxury, where the weight bears little proportion to the powers of the noble animals employed, I acknowledge that the sinews are more than sufficient; but to bear up the head of a poor horse at plough, or any other slow heavy work, is, I conceive, a barbarous error, which ought not to be persisted in.

ON THE USE OF BLINKERS (OR BLINDS) FOR CARRIAGE HORSES.

From the same.

Odd as it may sound, it is nevertheless true, that German-post horses have seldom what we should term bridles. Snaffle-bits ending with T's instead of rings, being put into their mouths, are hooked (by these T's) to iron billets in the head-pieces of common stable halters, by which arrangement, to feed the animal, it is only necessary, without taking them from the carriage, to unhook one end of the bits, which then immediately falls from their mouths; a slight trough on four legs is then placed before them, and the traveller generally continues, as I did, to sit in his carriage watching the horses eating up slices of black rye bread.

In England, there is no surer receipt known for making a pair of horses suddenly run away with one's carriage, than by taking off their blinkers to allow them to see it; but though our method decidedly suits us the best, yet in Germany the whole system of managing horses from beginning to end is completely different from ours. Whether there is most of the horses in a German, or of the German in a horse, is a nice point on which people might argue a great deal; but the broad fact really is, that Germans live on more amicable terms with their horses, and understand their dispositions infinitely better, than the English; in short, they treat them as horses, while we act towards them, and drill them, as if they were men; and in case that any one should doubt that Germans are better horsemasters than we are, I beg to remind them of what is perfectly well known to the British army—namely, that in the peninsular war the cavalry horses of the German Legion were absolutely fat, while those of our regiments were skin and bone.

In a former chapter I have already endeavored to explain, that instead of reining a horse's head *up*, as we do, for draught, the Germans encourage the animal to keep it *down*; but besides this, in all their other arrangements they invariably attend to the temper, character, and instinct of the beast. For instance, in harness, they entrust these sensible animals (who are never known to forget what they have once seen) with the free use of their eyes. The horses see the wheel strike a stone, and they avoid the next one; if they drag the carriage against a post, they again observe the effect; and seeing at all times what is behind them, they know that by kicking they would hurt themselves: when passengers and postillion dismount, from attentive observation, they are as sensible as we are that the draught will suddenly become less, and, consequently, rejoicing at being thus left to themselves, instead of wishing to run away, they invariably are rather disposed to stand still.

As soon as getting tired, or as we are often too apt to term it, "lazy," they see the postillion threaten them with his whip, they know perfectly well the limits of his patience, and that after eight, ten, or twelve threats, there will come a blow: as they travel along, one eye is always shrewdly watching the driver—the moment he begins the heavy operation of lighting his pipe, they immediately slacken their pace, knowing, as well as Archimedes could have proved, that he cannot strike fire and them at the same time; every movement in the carriage they remark; and to any accurate observer who meets a German vehicle it must often be perfectly evident that the poor horses know and feel, even better than himself, that they are drawing a coachman, and three heavy baronesses with their maid, and that to do that on a hot summer's day is—no joke. When their driver urges them to proceed, he does it by degrees; and they are stopped, not as bipeds, but in the manner quadrupeds would stop themselves.

Now, though we all like our own way best, let us for a moment (merely while the horses are feeding) contrast with the above description our English mode of treating a horse.

In order to break in the animal to draught, we put a collar round his neck, a crupper under his tail, a pad on his back, a strap under his belly, with traces at his sides, and lest he should see that though these things tickle and pinch, they have not power to do more, the poor intelligent creature is blinded with blinkers; and in this fearful state of ignorance, with a groom or two at his head and another at his side, he is, without his knowledge, fixed to the pole and splinter-bar of a carriage. If he kicks, even at a fly, he suddenly receives a heavy punishment, which he does not comprehend—something has struck him, and has hurt him severely; but as fear magnifies all danger, so, for aught we know, or care, he may fancy that the splinter-bar, which has cut him, is some hostile animal, and expect when the pole bumps against his legs, to be again assailed in that direction.

Admitting that in time he gets accustomed to these phenomena, becoming what we term steady in harness, still to the last hour of his existence, he does not clearly understand what it is that is hampering him, or what is that rattling noise

which is always at his heels: the sudden sting of the whip is a pain with which he gets but too well acquainted, yet the "unde derivatur" of the sensation he cannot explain—he neither knows when it is coming, nor where it comes from. If any trifling accident, or even irregularity, occurs—if any little harmless strap, which ought to rest upon his back, happens to fall to his side—the poor, noble, and intelligent animal, deprived of his eyesight, the natural lanterns of the mind, is instantly alarmed: and though from constant heavy draught he may literally, without metaphor, be on his last legs, yet if his blinkers should happen to fall off, the sight of his own master—of his very own pimple-faced mistress—and his own fine yellow carriage in motion—would scare him so dreadfully, that off he would probably start, and the more they all pursued him the faster would he fly!

MANNER OF SHOEING HORSES IN GERMANY.

From the same.

In passing the shop of a blacksmith, who lived opposite to the Goldene Kette, the manner in which he tackled and shod a vicious horse always amused me. On the outside wall of the house, two rings were firmly fixed; to one of which the head of the patient was lashed close to the ground; the hind foot to be shod, stretched out to the utmost extent of the leg, was then secured to the other ring about five feet high, by a cord which passed through a cloven hitch, fixed to the root of the poor creature's tail.

The hind foot was consequently very much higher than the head; indeed it was so exalted, and pulled so heavily at the tail, that the animal seemed to be quite anxious to keep his other foot on *terra firma*. With one hoof in the heavens, it did not suit him to kick; with his nose pointed to the infernal regions he could not conveniently rear, and as the devil himself was apparently pulling his tail, the horse at last gave up the point, and quietly submitted to be shod.

THE MANAGEMENT OF SWINE IN A COUNTRY WITHOUT FENCES.

From the same.

Every morning at half-past five o'clock, I hear, as I am dressing, the sudden blast of an immense long wooden horn, from which always proceed the same four notes. I have got quite accustomed to this wild reveille, and the vibration has scarcely subsided, it is still ringing among the distant hills, when, leisurely proceeding from almost every door in the street, behold a pig! Some from their jaded, care-worn, draggled appearance, are evidently leaving behind them a numerous litter; others are great, tall, monastic, melancholy looking creatures, which seem to have no other object left in this wretched world than to become bacon; while others are thin, tiny, light-hearted, brisk, petulant piglings, with the world and all its loves and sorrows before them. Of their own accord these creatures proceed down the street to join the herdsman, who occasionally continues to repeat the sorrowful blast from his horn.

Gregarious, or naturally fond of society, with one curl in their tails, and with their noses almost touching the ground, the pigs trot on, grunting to themselves and to their comrades, halting only whenever they come to any thing they can manage to swallow.

I have observed that the old ones pass all the carcasses, which trailing to the ground, are hanging before the butchers' shops, as if they were on a sort of *parole d'honneur* not to touch them; the middle-aged ones wistfully eye this meat, yet jog on also, while the piglings, who (so like mankind) have more appetite than judgement, can rarely resist taking a nibble; yet, no sooner does the dead calf begin again to move, than from the window immediately above out pops the head of a butcher, who, drinking his coffee, whip in hand, inflicts a prompt punishment, sounding quite equal to the offence.

As I have stated, the pigs, generally speaking, proceed of their own accord; but shortly after they have passed, there comes down our street a little bareheaded, barefooted, stunted dab of a child, about eleven years old,—a Flibbertigibbet sort of creature, which in a drawing, one would express by a couple of blots, the small one for her head, the other for her body; while streaming from the latter, there would be a long line ending in a flourish, to express the immense whip which the child carries in its hand. This little goblin page, the whipper-in, attendant, or aid-de-camp of the old pig-driver, facetiously called at Langen-Schwalbach, the "Schwein-general," is a being no one looks at, and who looks at nobody. Whether the hofs of Schwalbach are full of strangers, or empty—whether the promenades are occupied by princes or peasants—whether the weather is good or bad, hot, or rainy, she apparently never stops to consider: upon such vague subjects, it is evident she never for a moment has reflected. But such a pair of eyes, for a pig, have perhaps seldom beamed from human sockets! The little intelligent urchin knows every house from which a pig ought to have proceeded; she can tell by the door being open or shut, and even by footmarks, whether the creature has joined the herd, or whether having overslept itself, it is still snoring in its sty—a single glance determines whether she shall pass a yard or enter it; and if a pig, from indolence or greediness, be loitering on the road, the sting of the wasp cannot be sharper or more spiteful than the cut she gives it. As soon as finishing with one street, she joins her general in the main road, the herd slowly proceed down the town.

As I followed them this morning, they really appeared to have no hams at all; their bodies were as flat as if they had been squeezed in a vice; and when they turned sideways, their long sharp noses and tucked-up bellies, gave to their profile the appearance of starved grey-hounds.

As I gravely followed this grunting, unearthly looking herd of unclean spirits, through that low part of Langden-Schwalbach which is solely inhabited by Jews, I could not help fancying that I observed them holding their very breaths, as if a loathsome pestilence were passing; for though fat pork be a wicked luxury— a forbidding pleasure which the Jews has been supposed occasionally in secret to indulge in, yet one may easily imagine that such very lean ugly pigs have not charms enough to lead them astray.

Besides the little girl who brought up the rear, the herd was preceded by a boy of about fourteen, whose duty it was not to let the foremost, the more enterprising, or in other words, the most empty

pig advance too fast. In the middle of the drove, surrounded like a shepherd by his flock, slowly stalked the "Schwein General," a wan, spectre looking old man, worn out, or nearly so by the arduous and every-day duty of conducting, against their wills, a gang of exactly the most obstinate animals in creation. A single glance at his jaundiced, ill-natured countenance, was sufficient to satisfy one that his temper had been soured by the vexatious contrarieties and "untoward events" it had met with. In his left hand he held a staff to help himself onwards, while round his right shoulder hung one of the most terrific whips that could possibly be constructed. At the end of a short handle, turning upon a swivel, there was a lash about nine feet long, formed like the vertebræ of a snake, each joint being an iron ring, which decreasing in size, was closely connected with its neighbor by a band of hard greasy leather. The pliability, the weight, and the force of this iron whip, rendered it an argument which the obstinacy even of the pigs was unable to resist; yet as the old man proceeded down the town, he endeavored to speak kindly to the herd; and as the bulk of them preceded him, jostling each other, grumbling and grunting on their way, he occasionally exclaimed, in a low, hollow, worn-out tone of encouragement, "Nina! Anina!" (drawling of course, very long on the last syllable.)

If any little savory morsel caused a contention, stoppage, or constipation on the march, the old fellow slowly unwound his dreadful whip, and by merely whirling it round his head, like reading the Riot Act, he generally succeeded in dispersing the crowd; but if they neglect this solemn warning, if their stomachs proved stronger than their judgements, and if the group of greedy pigs still continued to stagnate—"Arriff!" the old fellow exclaimed, and rushing forwards, the lash whirling round his head, he inflicted, with strength which no one could have fancied he possessed, a smack that seemed absolutely to electrify the leader. As lightning shoots across the heavens, I observed the culprit fly forwards, and for many yards continuing to sidle towards the left, it was quite evident that the thorn was still smarting in his side; and no wonder, poor fellow! for the blow he received would almost have cut a piece out of a door.

As soon as the herd got out of the town, they began gradually to ascend the rocky barren mountain which appeared towering above them; and then the labors of the Schwein general and his staff became greater than ever; for as the animals from their solid column began to extend or deploy themselves into line, it was necessary constantly to ascend and descend the slippery hill, in order to outflank them. "Arriff!" vociferated the old man, striding after one of his rebellious subjects; "Arriff!" in a shrill tone of voice was re-echoed by the lad, as he ran after another; however, in due time, the drove reached the ground which was devoted for that day's exercise the whole mountain being thus taken in regular succession.

The Schwein general now halted, and the pigs being no longer called upon to advance, but being left entirely to their own notions, I became exceedingly anxious attentively to observe them.

No wonder, poor reflecting creatures! that they had come unwillingly to such a spot—for there appeared literally to be nothing for them to eat but hot stones and dust; however, making the best of the bargain, they all very vigorously set themselves to work. Looking up the hill, they dexterously began to lift up with their snouts the largest of the loose stones, and then grubbing their noses into the cool ground, I watched their proceedings for a very long time. Their tough wet snouts seemed to be sensible of the quality of every thing they touched; and thus, out of the apparently barren ground, they managed to get fibres of roots, to say nothing of worms, beetles, or any other travelling insects they met with. As they slowly advanced working up the hill, their ears most philosophically shading their eyes from the hot sun, I could not help feeling how little we appreciate the delicacy of several of their senses, and the extreme acuteness of their instinct.

In this situation do the pigs remain every morning for four hours, enjoying little else than air and exercise. At about nine or ten o'clock, they begin their march homewards, and nothing can form a greater contrast than their entry into their native town does to their exit from it.

Their eager anxiety to get to the dinner-trough that awaits them is almost ungovernable; and they no sooner reach the first houses of the town, than a sort of "sauve qui peut" motion takes place; away each then starts towards his dulce domum: and it is really curious to stand still and watch how very quickly they canter by, greedily grunting and snuffling, as if they could smell with their stomachs, as well as their noses, the savory food which was awaiting them.

At half-past four, the same four notes of the same horn are heard again; the pigs once more assemble—once more tumble over the hot stones on the mountain—once more remain there for four hours—and in the evening once again return to their styes.

Such is the life of the pigs not only of Langen-Schwalbach, but of those of every village throughout a great part of Germany: every day of their existence, summer and winter, is spent in the way I have described. The squad consists here of about a hundred and fifty, and for each pig the poor old Schwein general receives forty kreuzers, (about 13*d.*) for six months' drilling of each recruit. This income, therefore, is about £20 a year, out of which he has to pay the board, lodging, and clothing of his two aid-de-camps; and when one considers how unremittingly this poor fellow creature has to contend with the gross appetites, sulky tempers, and pig-headed disposition of the swinish multitude, surely not even the most niggardly reformer would wish to curtail his emoluments.

HARVEST LABORS IN GERMANY, AND WORKING COWS.

From the same.

All this day I have been strolling about the fields watching the getting in of the harvest. The crops of oats, rye, and wheat (principally bearded) are much heavier than any one would expect from such light and apparently poor land; but the heavy dews which characterise the summer climate of this high country impart a nourishment which, in richer lands, often lies dormant from drought. In Nassau, the corn is cut principally by women, who

use a sickle so very small and light, that it seems but little labor to wield it. They begin early in the morning, and with short intervals of rest continue till eleven o'clock, when the various village bells suddenly strike up a merry peal, which is a signal to the laborers to come home to their dinners. It is a very interesting scene to observe, over the undulating surface of the whole country, groups of peasants, brothers, sisters, parents, &c., all bending to their sickles, to see children playing round infants lying fast asleep on the blue smock-frocks placed under the shade of the corn sheafs. It is pleasing to remark the rapid progress which the several parties are making; how each little family, attacking its own patch or property, works its way into the standing corn, leaving the crop prostrate behind them; and then, in the middle of this simple, rural, busy scene, it is delightful indeed, to hear from the belfry of their much revered churches a peal of cheerful notes, which peacefully sound "lullaby" to them all. In a very few seconds the square fields and little oblong plots are deserted, and then the various roads and paths of the country suddenly burst in lines upon the attention, each being delineated by a string of peasants, who are straggling one behind the other, until paths in all directions are seen converging towards the parent village churches, which seem to be attracting them all.

As soon as each field of corn is cut, it is bound into sheaves, about the size they are in England: seven of these are then made to lean towards each other, and upon them all is placed a large sheaf reversed, the ears of which hanging downwards form a sort of thatch, which keeps this little stack dry until its owner has time to carry it to his home. It generally remains many days in this state, and after the harvest has been all cut, the country covered with these stacks resembles a vast encampment.

The carts and wagons used for carrying the corn are exceedingly well adapted to the country. Their particular characteristic is excessive lightness, and indeed, were they heavy, it would be quite impossible for any cattle to draw them up and down the hills. Occasionally they are drawn by horses—often by small active oxen; but cows more generally perform this duty, and with quite as much patience as their mistresses, at the same moment are laboring before them at the sickle. The yoke, or beam, by which these cows are connected, is placed immediately behind their horns; a little leather pillow is then laid upon their brow, over which passes a strap that firmly lashes their heads to the beam, and it is, therefore, against such soft cushions that the animals push to advance: and thus linked together for life, by this sort of Siamese band, it is curious to observe them eating together, then by agreement raising their heads to swallow, then again standing motionless chewing their cud, which is seen passing and repassing from the stomach to the mouth.

At first, when standing near them, I smelt from their breath their sweet fresh milk, it seemed hard that they should thus be as it were, domestic candles, lighted at both ends; however, verily do I believe that all animals prefer exercise, or even hard work, to any sort of confinement, and if so, they are certainly happier than our stall-fed cows, many of which, in certain parts of Britain, may be seen with their heads fixed economically for months between two vertical beams of wood. The Nassau cows certainly do not seem to suffer while working in their light carts; as soon as their mistress advances, they follow her, and if she turns and whips them, then they seem to hurry after her more eagerly than ever.

It is true, hard labor has the effect of impoverishing their milk, and the calf at home is consequently (so far as it is concerned) a loser by the bargain; however, there is no child in the peasant's family who has not had cause to make the same complaint, and therefore, so long as the laborer's wife carries her infant to the harvest, the milch cow may very fairly be required to draw to the hovel what has been cut by her hands.

Nothing can be better adapted to the features of the country, nothing can better accord with the feeble resources of its inhabitants, than the equipment of these economical wagons and carts: the cows and oxen can ascend any of the hills, or descend into any of the valleys; they can, without slipping, go sideways along the face of the hills, and in crossing the green swampy grassy ravines, I particularly remarked the advantage of the light wagon drawn by animals with cloven feet, for had one of our heavy teams attempted the passage, like a set of flies walking across a plate of treacle, they would soon have become unable to extricate even themselves. But in making the comparison between the horse and the cow, (as far as regards Nassau husbandry,) I may observe, that the former has a very expensive appetite, and wears very expensive shoes; as soon as he becomes lame he is useless, and as soon as he is dead, he is carrion. Now a placid, patient Langen-Schwalbach cow, in the bloom of her youth, costs only two or three pounds; she requires neither corn nor shoeing: the leaves of the forest drawn by herself to the village, form her bed, which in due time she carries out to the field as manure: there is nothing a light cart can carry which she is not ready to fetch, and from her work she cheerfully returns to her home to give milk, cream, butter, and cheese to the establishment; at her death, she is still worth eleven kreuzers a pound as beef; and when her flesh has disappeared, her bones, after being ground at the mill, once again appear upon her master's fields, to cheer, manure, and enrich them.

STEAM CARRIAGES ON COMMON ROADS.

From the London Morning News.

These wonderful machines are now constructed with sufficient mechanical skill, amount of power, safety, and general efficiency, to ensure their successful employment on any good road, and it is certainly time for our capitalists to turn their attention to them as legitimate objects of support, and as offering the means of a profitable investment. From the earliest developement of the capabilities of steam, as applicable to purposes of locomotion, on properly constructed roads, we have carefully watched the progress made by different inventors, and have on many occasions borne testimony to the unceasing efforts of two of the most persevering and deserving among them; of two who have from time to time, promised less and performed more than any of their contemporaries—we mean Col. Maceroni and Mr. Hancock. On Saturday we had a trip on the Edgeware road, with the second coach constructed by the gallant Colonel.

Starting from the Paddington wharf, No. 19, we proceeded on the road in the most surprising style, the coach being turned, checked, stopped or having its speed increased under the complete command of the conductor. About three miles out we passed a stage coach, whose four horses were put to their utmost speed, with a comparative velocity to that with which the stage coach would have passed a wagon, our rate being at that time about eighteen miles an hour. Soon after this we ascended Windmill-hill with perfect ease; although, in consequence of the road undergoing repair, the part we had to ascend was cut into deep ruts covered with dry soil and dust from three to six inches deep; forming perhaps, the most uncertain and disadvantageous fulcrum on which the wheel of a steam-carriage could ever have to act. We arrived at Welch Harp Inn, which is several perches over the five miles from our starting place, and turned the coach in the direction of Paddington, in precisely twenty minutes; having performed the distance, inclusive of stopping at the turnpike, and on two other occasions, and despite the bad condition of Windmill-hill, at the extraordinary average rate of fifteen miles an hour. Our return occupied the same period of time; and after this completion of the trip we made the round of Paddington-green to gratify some gentlemen who had not arrived in time to witness the more extensive trial. Among our fellow passengers on these occasions were Jerome Buonaparte, ex-King of Westphalia, Prince Jerome his son, the Duke de Montfort, the Marquis Azolino, M. Vigne de Marveille, and other distinguished foreigners.

From the same paper.

Sir,—You certainly have made a mistake in saying that the coach, on Saturday last, went at eighteen miles the hour, when it overtook and passed the stage whose four horses were "put to their utmost speed, with a velocity comparative to that with which the stage coach would have passed a wagon."

Wyatt, of the Watford and Aylesbury coach, the one to which you refer, is very angry at your asserting that his fine team of horses were overtaken and passed in the manner you speak of by the steamer, when the latter did not perform more than eighteen miles the hour! Wyatt knows the steamer well; he was once beaten by it going up Windmill-hill; and he says—and I say—and all the others say, that when the steam carriage overtook him, and passed him on Saturday, it was undoubtedly at a pace of more than twenty-four miles the hour.

We have many times done two miles in five minutes, and you shall see it done again whenever you are so disposed.

You show that the speed of the whole ten miles, including several stoppages and the turnpike, &c, was above fifteen miles the hour. Surely to overtake and pass a team of four fine horses at their "utmost speed" as we did, must have required more than eighteen?

But to set the matter at rest in your mind, I will keep a seat for you in the carriage on an occasion which will offer in a few days, of putting to the test at their utmost speed, a chosen team of horses, a fourteen mile heat, on the most hilly and softest road out of London. I have the honor to be, sir, your most obedient servant,

FRANCIS MACERONI.

Wharf, 19, *Paddington-green*, *May* 26, 1834.

FAT SHEEP IN SUMMER, AND MAGGOTS IN THE HEAD.

From the Genesee Farmer.

A writer in the Farmer's Journal, after stating that he applies tar to the roots of the horns of sheep, and puts a little in their noses and mouths, "as affording the best security against the maggot in the head," gives the following remarks on the management of sheep in the summer:

"I am careful to have none of my sheep, except those I intend for market, get very fat during the summer. I have heard it remarked, and I believe it, that after once *very* fat, a sheep will never arrive at the same point again. Sheep which get fat during the summer, certainly do not do as well in the fall and winter. About the middle of September I give my sheep the best feed I can, and the middle of October begin to feed sparingly with turnips, potatoes, or some kind of grain. When the time arrives for yarding, which I do rather late, I separate my flock in the following manner: In one yard I put my rams and weathers, except such of the former as have become very poor during the time of running with ewes. In the second I put my last spring lambs; in the third all my healthy ewes, and in the fourth my old and weak (but not diseased) ewes. A sixth department is a kind of hospital, into which every sheep is removed as soon as discovered to be afflicted with disease. This arrangement I consider very important, as it affords an opportunity for treating every class of sheep in the manner judged most proper for their circumstances. I have known instances in which the lot of old and feeble ewes have come out much improved in the spring, and have procured a good fleece, and raised fine likely lambs. I always intend, however, to turn my sheep before they get so old as to become enfeebled; as they are more likely to acquire those diseases which spread through the flock.

MACHINE FOR GETTING OUT STAVES FOR BARRELS.

From the Rochester Democrat.

Messrs. Levi and Luther Benton, citizens of this county, have lately invented a Stave Machine, which is now in successful operation in the village of Scottsville. The utility of this invention consists in the despatch with which it operates, the facilities it affords for manufacturing staves from timber before unavailable for that purpose, and the perfect finish it gives to a barrel constructed from staves prepared by it. It is satisfactorily ascertained, that with the labor of three men, it will saw, dress, and joint, one thousand staves in an hour, and that this can be done from any description of timber without reference to the kind, or the irregularity of the grain; and when finished they are superior to those wrought by hand, both in regularity of their form and appearance of their surface. I will not occupy room, in detailing its peculiar and ingenious construction. It is of itself a mechanical curiosity worthy the personal examination of every inquiring man, and particularly

those immediately interested in its beneficial results. The machine first cuts the stave to its proper thickness by means of a circular saw, then with a chisel attached to a perpendicular wheel, gives it a convex and a concave shape, leaving the two surfaces smooth, and by a third process, cuts it to its proportioned width. The importance of this invention is already felt to a very considerable extent throughout the country. Oak timber in many sections cannot be obtained at the greatest cost and trouble, and in most or all milling districts is procured at a great inconvenience and expense. The rapidly increasing agriculture of the northern and western states, and the corresponding decrease of oak timber, will very soon realize to the community, the policy of its adoption generally, and a very few years will render this, or a like invention indispensable.

D. K. B.

DISEASES OF WHEAT.

[Notwithstanding all the labors of agriculturists and of the men of science who have written on the diseases of wheat, there are few subjects more enveloped in obscurity, or offering more difficulty to the novice who endeavors to investigate the causes of any of the many diseases to which this plant is subject. It is not so much on account of the errors and mistakes of the various writers, (considerable as they doubtless are,) as to the facts they have asserted, that the difficulty has arisen, as to the want of *clearness and uniformity* in the use of names, and the uncertainty as to what disease is meant by any one particular name. The terms *blight*, *mildew*, *rust*, *blast*, *smut*, *scab*, *stud*, *stunt*, have been used in either England or this country, so loosely, that it cannot be known what is meant by either, without a very particular description of the symptoms of the disease: and the symptoms are seldom described plainly enough for this end. A great service might be rendered by any person, who, from his acquaintance with the actual diseases, and with what has been published concerning them, could adjust properly terms and descriptions, and merely give a clear account of the opinions entertained in England and America, of the causes and remedies of the diseases of wheat, and how far those of the one country are identical with those of the other. This would enable us at least to profit by the knowledge already existing, but which is sealed up from most persons by the improper use of names, either by the writer or reader—and doubts are thus created, even as to the terms that are properly applied. But far greater benefits might be conferred on agriculture in this respect, if scientific men would pursue the investigation, and not only define the diseases, but search out their causes, and thence the remedies.

The three following papers on as many different diseases in wheat, are uncommonly satisfactory. The particular descriptions given leave no doubt as to the identity of the first two with those we know as the *smut*, and the *blast* or *black-head*. The writer has traced these diseases to their hidden causes by a course of patient and careful investigation—and thence has correctly deduced that the proper means to avoid the evil is to destroy on the seed wheat, the sources of the diseases which he had there discovered. Without this course of reasoning, or knowing the cause of the disease, farmers have accidentally found the benefit of liming the seed to prevent smut ("the pepper brand") in wheat—and an experiment published in the Farmers' Register, (Vol. I. p. 275) shows the like benefit from a similar treatment of oats infected with the blast, (or "dust brand.") These coincidences of accidental practice with theoretical reasoning are highly satisfactory: and though, in these cases, accident had discovered the remedy more early than science had made known the cause, it does not therefore lessen the value of the latter mode of investigation. A very similar discovery has lately been published (page 219 of Farm. Reg.) of the eggs of the very destructive turnip fly being discovered on the seeds, *before* any effectual means had been found to arrest its ravages. If this fact is established, it leads at once to an obvious mode of destroying the insect, by some kind of wash for the seeds. The disease of wheat described last in order by the writer, if it belongs to this country, is not known to us, but may be so to more close observers.

The descriptions of the author are accompanied by a number of figures, which serve, as well as his descriptions, to prove the identity of the first two diseases with those above named. But these figures are not necessary to farmers who know the actual diseases; and others which represent microscopic fungi and animalculæ, would be of no use to any who did not seek for the originals with powerful magnifying glasses. To save a considerable expense therefore, the figures are omitted, and also those passages which merely refer to the figures.]

THE SMUT BALLS OR PEPPER BRAND.

From the Penny Magazine.

[We are indebted for the following interesting paper to Francis Bauer Esq., a gentleman who has attained a most deserved celebrity for his valuable discoveries connected with the diseases of grain, the most important article of human food.]

The existence of this destructive disease in wheat has long been known to every agriculturist in England, as well as by those on the continent; but the real cause of it is yet very little known; not only by the practical cultivator, but even by scientific authors. Such erroneous and contradictory opinions have been advanced that the farmer cannot possibly derive any satisfactory information from them. I hope, however, that the following observations and illustrations of facts may be acceptable to some of the numerous readers of the Penny Magazine.

This disease is occasioned by the seeds of an extremely minute parastic fungus, of the genus *uredo*, being absorbed by the roots of the germinating wheat grains and propelled by the rising sap, long before the wheat blossoms, into the young germen or ovum, where the seeds of the fungi vegetate, and rapidly multiply, thereby preventing, not only the fecundation of the ovum, but even the developement of the parts of fructification. In consequence no embryo is produced in an infected germen, which however continues to grow as long as the sound grains do, and, when the sound grains arrive at maturity, the infected ones are generally larger than, and are easily distinguished from, the sound grains, by their darker green color, and from the ova retaining the same shape and form

which they had at the time when infection took place.

The name of this disease is also as undecided and various as the hitherto supposed causes of its existence, the most prevailing names in England, being *Smut Ball*, Pepper Brand, and Brand Bladders; and many others have been given to it, not only by the farmers in almost every county, but also by scientific naturalists.

No author has yet been found who mentions or describes this species of *uredo*, the distinguishing characteristic of which being its extremely offensive smell; I think the most proper specific name for it would be that of *uredo fœtida*.

The earliest period at which I discovered the parasite within the cavity of the ovula of a young plant of wheat (the seed grain of which had been inoculated with the fungi of *uredo fœtida*, and sown the 14th of November, 1805) was the 5th of June, 1806, being sixteen days before the ear emerged from its hose, and about twenty days before the sound ears, springing from the same root, were in bloom. At that early stage the inner cavity of the ovum is very small; and, after fecundation, is filled with the albumen or farinaceous substance of the seed, and already occupied by many young fungi, which, from their jelly-like root or spawn, adhere to the membrane which lines the cavity, and from which they can be easily detached in small flakes with that spawn: in that state their very short pedicles may be distinctly seen. At first the fungi are of a pure white color, and when the ear emerges from its hose the ovum is much enlarged, but still retains its original shape, and, the fungi rapidly multiplying, many have then nearly come to maturity, assumed a darker color, and having separated from the spawn, lie loose in the cavity of the ovum: the infected grains continue growing, and the fungi continue to multiply till the sound grains have attained their full size and maturity, when the infected grains are easily distinguished from the sound ones by being generally larger, and of a darker green color; and if opened, they appear to be filled to excess with these dark-colored fungi: but the grains infected with the *uredo fœtida* very rarely bursts, and these fungi are seldom found on the outside of the grain; but if the grain be bruised they readily emit their offensive smell, which is worse than that from putrid fish. When the sound grains are perfectly ripe and dry, and assume their light brown color, the infected grains also change, but to a somewhat darker brown, retaining however the same shape which the ovum had at its formation; the rudiments of the stigma also remaining unaltered.

If the infected grain be cut in two, it will be found to consist solely of the outermost integument of the ovum, filled with the ripe black fungi, without any tract of the embryo or albumen.

Plants of wheat infected with the *Pepper Brand* may be easily distinguished in the field by their size, being generally several inches higher than plants not infected, and larger in bulk; and I have found in all instances a greater number of stems produced from the same root, the ears containing more spickets, and those spickets more perfect grains, than were contained in those of sound plants, of the same seed, and growing in the same field.

One plant, produced from seed which I had inoculated, had twenty-four complete stems and ears, some of the stems with the ears measuring above five feet every part of the plant proportionally large, and all the ears entirely infected. Another specimen had eight stems from the same root five of them were above six feet high, and the ears entirely infected; the other three stems were considerably shorter, their ears smaller, and their grains perfectly sound.

This enlargement of the plant, however, is not to be attributed to the infection, but is undoubtedly the consequence of a luxurious vegetation, produced by a rich or moist soil, which secures and promotes the infection more than a dry or moderately rich soil.

Neither does this disease always affect the entire ear: I found some ears having one side infected, whilst the opposite side was perfectly sound. Sometimes five or six perfectly sound grains are found in an infected ear, and a few thoroughly infected grains are found in an otherwise sound ear. The infected grains are always in the last spicket at the apex of the ear; from which it appears that the infecting seed of the fungi did not reach the ovum before fecundation: in some of these grains a portion of the albumen was formed, but no trace of an embryo existed; but in others there was a considerable portion of albumen, and a perfect embryo formed.

At the time when the sound grains change their color, the fungi, being ripe, cease to multiply; they are all of a globular form, and nearly of equal size, viz. $\frac{1}{1000}$ part of an inch in diameter. Fig. 8 is $\frac{1}{1000000}$ part of a square inch on the micrometer; it sustains sixteen full grown fungi of *uredo fœtida;* and this square, being represented of the size of a square inch, English measure, is consequently magnified one hundred and sixty thousand times in superficies, and the sixteen fungi represented in that square are magnified in the same degree; showing that no less than two millions five hundred and sixty thousand individual fungi would be required to cover one square inch.

Fig. 9 represents a fungus not quite ripe, with its short pedicle; and fig. 10 a perfectly ripe one, both magnified one thousand times lineally, or one million times superficially. These figures are thus highly magnified, to show the reticular structure of these fungi, which forms the external membrane; and it appears that the internal substance consists of a cellular tissue.

Fig. 11 represents one of the fungi shedding its seeds, which is only observable when viewed under water. I could never yet see the seeds of these fungi in a dry state, for they then appear to be mixed with some mucous fluid, which causes them to adhere together in hard lumps.

That the seeds of the fungi of *uredo fœtida* are the sole cause of that destructive disease in wheat, the *Pepper Brand*, I think I have fully ascertained by numerous experiments of inoculating even the finest and purest samples of seed-wheat; and if that fact be admitted, it becomes evident that the prevention of it can only be effected by cleansing the seed-wheat so effectually, that every particle of the fungi and their seeds be entirely removed from the grains. But as these extremely minute fungi, when once mixed with the seed-wheat, insinuate themselves into the grooves at the backs and the beards at the tops of the wheat-grains, I think it almost impossible to dislodge them by the mere process of washing. I once received

some samples which had been so prepared, and washed in salt water, and declared to be perfectly clean; but on my putting some of these purified grains into water, in a watch-glass, and leaving them to soak about twelve hours, on then bringing them under the microscope I found many of the fungi floating on the water. This fact convinces me that mere cleansing is no secure preventive of this disease; and that the most efficacious, and perhaps the only remedy for preventing it, is that of depriving the seeds of the fungi of their vitality. To effect this, innumerable remedies have been recommended, and I believe applied by the farmers, but have seldom proved entirely successful. From my own often repeated experiments, though on a limited scale, I am convinced that the best and surest remedy is to steep the seed-wheat in properly prepared lime-water, leaving it to soak at least twelve hours, and then to dry it well in the air before sowing it; but I fear that it will be found very difficult, if not impossible, even by this method, to kill the seeds of the fungi entirely, when the quantity of seed-corn is great; and consequently some infected plants might still be found in large fields.

Steeping and properly drying the seed-corn in the above manner, not only prevents the disease arising from the infected seed-corn, but does also effectually prevent the clean seed from being infected by the seed of the fungi, which might exist in the soil of a field on which diseased wheat had been growing before; and consequently the cleanest samples of seed-wheat should be steeped, as well as the most notoriously infected.

These facts I have ascertained by repeated experiments of strongly inoculating with the fungi seed-corn which before had been properly steeped and dried, and the result has always proved satisfactory, for the infection never took place.

Wheat is the only plant that is liable to be affected by the Pepper Brand, which is occasioned by the *uredo fœtida*. The Smut, or Dust Brand, is also occasioned by an uredo, but of a decidedly different species.

F. B.

Kew, February 21, 1833.

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THE SMUT, OR DUST BRAND.

From the same.

This disease, like the *Smut Balls* or *Pepper Brand*, is occasioned by a very minute parasitic fungus, of the genus *uredo*, which Persoon (in his Synopsis Methodica Fungorum) notices as *uredo segetum*. It is, however, of a decidedly different species from *uredo fœtida*, which occasions the Smut Balls or Pepper Brand, illustrated in my former paper.

The *uredo segetum* is distinguished from *uredo fœtida*, not being much more than one-half the size and by being perfectly scentless; whilst *uredo fœtida* is characterized by an extremely offensive smell. The manner in which *uredo segetum* acts upon the plants which it attacks is also very different, and the effect much more destructive than that of *uredo fœtida*, which only attacks the grains in which it vegetates, but seldom bursts; whereas the *uredo segetum* not only generally destroys the whole ear, but even the leaves and stem. Further, *uredo segetum* attacks not only barley, but wheat and oats; and I have been informed that other species of gramineæ are subject to its attacks, but I have not yet found any such specimens.

I have ascertained, by repeated experiments of inoculation, that the seedof the fungi of *uredo segetum*, like that of *uredo fœtida*, is absorbed by the roots of the germinating seed-corn and, being so extremely minute, is mixed with and propelled by the circulating sap, and deposited in almost every part, even in the cellular tissue of the plant where these seeds continue to vegetate and multiply rapidly, as well as in every part of the plant where there remains the least vitality. The whole ear is often found entirely destroyed many weeks before even the individual florets are quite developed, or the sound ears emerge from the hose. Sometimes, but rarely, the infection takes place after the parts of fructification have been formed, and even after fecundation has taken place; in that case the progress of the disease can easily be observed. The germen is generally the first attacked, and found partially, or half filled with the fungi then the pistlis, the stigmas, the anthers; and even the extremely tender filaments appear full of black spots which are occasioned by small clusters of these fungi, which vegetate and multiply so rapidly that in a few days the whole ear is completely filled.

In oat-plants such late infection occurs more frequently than in barley or wheat, and the whole panicle often emerges from its hose, to all appearance in a perfectly sound state, or perhaps with only a few infected spickets at its base, but the infection soon spreads visibly through the whole panicle and over every part of the plant; and even when such a partially infected ear is separated from the growing plant, the vegetation and multiplying of the fungi continue as long as any moisture remains in that portion of the plant which has been so separated. I once collected and cut off several such partially infected ears, which I intended to preserve as specimens, and for that purpose I laid them in brown paper to dry them: they were accidentally mislaid, and did not come into my hands again till after a period of six or seven months; when, on examination, I found that the whole specimens were consumed by the fungi. I have not the least doubt that the seeds of the fungi are shaken out by the wind; and that even many infected ears and plants are thrown on the soil of a field where such diseased plants have been growing, and that the fungi continue growing and multiplying on the soil, like those on the paper, until they become part of the soil, from which they cannot be distinguished.

I fear it will prove very difficult to find an efficient remedy to prevent, or even to check this destructive disease; and this fear seems strengthened by the consideration of the numerous remedies suggested by many eminent authors, as well in this country as on the continent. That the remedies of these authors should have failed in producing the desired effects is not surprising to me, for I find that the most eminent of them not only confound two or three distinct diseases, but are totally unacquainted with the real cause of any of the diseases: for some consider them caused by insects; some attribute them to blasts of the wind; others consider the disease to be a corruption of the sap of the plant. These, and many other causes, equally erroneous, have been advanced; but I hope that, if it be admitted that the seeds of the parasitical

fungi are the real and only cause of this disease, it will naturally occur to every one, that if the vitality of the seeds of these parasites could effectually be destroyed, the disease would be prevented. That the steeping in lime-water destroys the vitality, I have proved by many experiments; and also that lime-water has the same effect upon the seeds of the *uredo segetum*, as it has upon those of *uredo fœtida*.

I fear that much difficulty will present itself to the steeping the seed-corn effectively, from the structure of the seed of barley and oats, the kernels of which are so tightly enclosed in the husks, that the lime-water cannot so readily penetrate, and reach the embryo, as in the naked seed-kernels of wheat and rye; but if some ingenious and unprejudiced practical agriculturist would make experiments on a large scale, by which every grain of the seed-corn could be effectually steeped in lime-water, I have no doubt but that the diseases of the *Smut* or *Dust Brand*, and the *Smut Balls* or *Pepper Brand*, would be effectually prevented, and perhaps, after repeating the experiments for a few successive years, these diseases might be entirely eradicated from the land.

F. B.

Kew, March 3, 1833.

THE GRAIN WORMS—*Vibrio Tritici.*

The existence of this most extraordinary disease in wheat has been, comparatively speaking, but a very short time known; and it is only of a very recent date that it has attracted the notice of the practical agriculturists in this country. In July, 1807 I received, for the first time, some growing specimens of wheat-plants infected with this disease, from Kent, where it was said that the disease had existed some years, and, from its spreading, had attracted the notice of the farmers. They distinguish it by the odd names of *Ear-Cockles*, or *Brown Purples*, on account of the distorted shapes and dark-brown color of the diseased wheat-grains, which bear some resemblance to a weed generally growing in corn-fields, and vulgarly called *Corn-Cockles*, or *Purples*, the *Agrostema Githago* Linnæus. In Hampshire the disease is called *Burnt corn*.

From continued supplies of fresh specimens from Kent, I have been enabled to ascertain many important facts respecting the nature and properties of the minute animals engendering this disease. These experiments and results were so far satisfactory as to establish incontestably the fact, that the white fibrous substances within the cavities of the distorted grains consist of real organized animals, endowed with the extraordinary property of having their power of motion suspended for a considerable length of time, and of having it again restored by the mere application of water. But how are these animals introduced into the cavities of the young germens? And how are they propagated? These were questions which I could not at first answer, and I considered that these facts could only be ascertained by tracing the worms from the sowing of the seed-corn through the whole progress of the vegetation of the plant.

Being fully convinced that the worms or their eggs, like the seed of the fungi of the pepper-brand and dust-brand, must be absorbed by the germinating seed-corn, and propelled by the circulating sap into the young germens, and reflecting that I had successfully inoculated the wheat-grains with the fungi, I determined to try the same experiment with these worms; accordingly I selected a sufficient number of sound wheat-grains, and extracting a small portion of the worms from the cavities of the infected grains, (which had been previously soaked in water about an hour,) and placing some in the grooves on the posterior sides of the sound grains, I left them for some days to get dry, and planted them in the ground on the 7th of October, 1807. At the same time I planted some sound wheat-grains in separate holes, about two inches deep, and in each hole two or three infected grains also. About the middle of November most of the seeds had come up, and from time to time I took some of these young plants for examination, but did not perceive any effect of the inoculation till the 3rd of December, when, out of nine plants, five proved to be infected with live worms. In the first plant, after carefully splitting the young plant from the root upwards, I found in the then unorganized substances, between the radicle and the plumula, three young worms very lively, but not much larger than those with which the seed-corn was inoculated; in another plant I found one full-sized worm, but no eggs about it; in the third plant I found a still larger worm than the last, but in dividing the stem I had cut the worm in two, and it soon died; it seemed to be full of eggs: in the other two plants I found some worms quite young, and some half grown; but on the other four plants the inoculation had no effect. The fact that, at such an early stage of the vegetation of these inoculated seed grains, such large worms were found, confirms my first supposition, that it requires several generations of these worms to introduce their eggs into the young germens; the large worms found in the substance of the young stem were undoubtedly some of the original worms with which the seed-corn was inoculated, for they were on the point of laying their eggs in that stage, and these eggs, being again propelled by the rising sap a stage further, then come to maturity, and again lay their eggs, and thus progressively reach the elementary substance of the ear, where they are finally deposited in the then forming germens; the whole progress probably requiring three or four such reproductions.

(Mr. Bauer then describes many subsequent examinations of infected plants, referring to the representations and descriptions given. A detailed account of the nature and properties of these worms was laid before the Royal Society, read on the 5th of December, 1822, and published in the "Philosophical Transactions" of 1823, under the title of "Microscopical Observations on the Suspension of the Muscular Motions of the Vibrio Tritici.")

My experiments, for resuscitating the grain-worms, I have repeated almost every succeeding year to this day, and always with the same success; but I find that the longer the specimens are kept dry, the grains require to lay in water a greater length of time before the worms will recover; and that, at every repetition of an experiment, a smaller number of worms recover their motion, and that after the same specimens (the produce of the grains inoculated in 1807) had been kept dry *six years and one month*, the worms were all really dead; this period is the longest which I have as

yet ascertained that these worms can retain their reviviscent quality.

That this disease is contagious, is sufficiently proved by the fact, that it can at pleasure be successfully inoculated on the soundest seed-corn. The infection, however, is not so generally nor so readily communicated as the diseases occasioned by the fungi of the smut-balls or dust-brand, a few infected ears of which are capable of contaminating and infecting the whole contents of a barn. Grains infected with these worms having no embryos, cannot vegetate and produce again diseased grains themselves, but can only communicate the infection by coming in contact with the germinating seed-corn in the soil, by the moisture of which the worms are revived and extricate themselves, which I have so often observed they do when kept some time in water.

Steeping the seed-corn in lime-water, in the same manner as advised for preventing the diseases occasioned by the fungi, is the most efficacious method of preventing the spreading of this disease. I have repeated the experiment by inoculating, very strongly, sound wheat-grains with the worms, and afterwards steeping them in lime-water, and the infection was always prevented; I have also steeped some sound wheat-grains in lime-water, and after having kept them in a dry state for some days, I inoculated them strongly with the worms, but on examining the plants, not one instance of infection occurred. From these facts it is evident, that properly steeping the seed-corn in lime-water before sowing, is a sure preventive of the disease occasioned by grain-worms.

F. B.

MANURE FROM HOGS.

From the Northern Farmer.

One of the regular means which every farmer possesses, for the increasing of his stock of manure, and which is by no means the least valuable, is by many totally neglected. It is that of making their hogs serviceable in this business. Upon this point, I can speak from past experience, both in respect to the loss from neglect and the advantages derived from these valuable animals, when employed for this purpose. It was my practice, till within the last fifteen years, to permit my swine to roam at large in the highway, in the summer season; or what was but little better, confine them in a pasture, for three or four months during the warmest of the season; carrying whatever I might have to give them as feed, to the place in which they were confined. I began, however, after a while, to consider this course of turning hogs to pasture, or permitting them to run in the highway, to be altogether wrong. Upon mature reflection, I concluded that by confining them in a close yard, and furnishing them with the materials for making manure, the profits would be amply sufficient, not only to repay me for all the trouble of furnishing the materials, but would also enable me to give them better keeping; and, in this respect, my anticipations have been fully realized. One error, however, I committed in the outset, and I have noticed the same fault in others. It was this: my yard was at first made at least three times too large, embracing about two and a half rods of ground, for three or four hogs, the number which I generally keep; and I have seen yards including a much larger space made by some farmers, for an equal number of hogs. Now this, where the object is the making and saving manure, is, in my judgement, wrong; for, in so large a space, the quantity of materials put into the yard must be very great, or it must lie very thin over the yard; in either case, the benefit received from three or four hogs is but small; at least I found it so, where the materials, of whatever nature they might be, were put in one season and carried out the spring following. I therefore diminished my yard to twenty feet by fourteen, about one-third of its original dimensions; and I find this space to be sufficiently large for four hogs; and, I believe, large enough for even six to make manure to advantage; for in this space, materials sufficient for twenty or twenty-five loads of manure may be deposited in the course of one season; and what to me seems of the first importance in this business, is the hogs are kept continually on the materials, except when in their house, for the purpose of eating and sleeping.

My method of supplying these materials is the following: after having cleared their yard at the season of planting, I put into it such portions of straw as I may have left on hand after the season of foddering is past; and if I have not a sufficient quantity of this, to furnish the necessary supply till vegetable substances attain to a sufficient growth to be profitably collected, I put in earth collected from the low places, by the side of the highway; though this I more generally place in or near my barnyard, in a situation to receive and retain the wash that might otherwise escape from that. Brakes and weeds of any kind are valuable. These I make use of to the extent they are obtainable, when in a green state; as I consider green vegetable substances, for this purpose, far more valuable than dry. Potato tops when pulled for early use, before they become dry and shrivelled, I consider equal if not superior to any other green substances for this purpose. Pea-vines I usually put into my hog yard, after the peas are thrashed off; and if some are put in before being thrashed, they are as gratefully received by the inmates of the yard. Buck-wheat straw I have made use of, but I deem this to be of all substances the least valuable for the purpose of making manure, when it has ripened into a dry state, however valuable it may be when ploughed under in a green state, as it unquestionably is; being at that stage of its growth one of the most juicy plants of the vegetable kingdom.

I add nothing by way of materials to my hog yard, after the first of September, at which time I generally commence feeding, for the purpose of fattening; and by the middle or twentieth of December, my usual time for killing my hogs, I make from four to five loads of manure to each hog so kept, superior to the summer dung, obtained by yarding my cows. And the quantity made by my hogs is for each one double to that made by each cow for the same period of time.

Thus I have endeavored to present to the readers of the Farmer my method of adding to my stock of manure by the aid of my hogs from fifteen to twenty loads annually: whereas, I used formerly, as too many do at the present day, who call themselves farmers, entirely to neglect all these advantages, the improvement of which is so es-

sential to profitable farming. It is to be hoped, however, that no farmer, who has the opportunity of reading an agricultural paper, is so remiss in relation to that which is so conducive to his best interests.

MATTHEW BUELL, JR.

Newport, May 31st, 1834.

PETITION FOR A CHANGE OF THE LAW OF ENCLOSURES.

[We recommend the subject of the following petition to all who have not already considered it maturely—and to those who are satisfied of the unjust and oppressive operation of the law of enclosures, that they will forthwith proceed to *act*, for the removal of the grievance. Let similar petitions (either in this or any other form that may be preferred,) be prepared and properly presented to the consideration of the agricultural community, and there can be but small ground for fear as to the result.]

To the Editor of the Farmers' Register.

Essex, Aug. 9th, 1834.

I now send you an article which I hope will be in time for your next paper. It is a petition about to be circulated in this county, and I hope in many others, for changing the law relative to enclosures. No "internal improvement,"—always excepting that in regard to the general education of the people, which is first and above all others in importance—is so much wanted; nor any, I believe, to the great utility of which, if once carried into effect, converts would more rapidly be made. The people in the counties bordering on, and comprehending our mountains, may not yet, perhaps, have so generally felt the evils of this law, as to wish for its repeal; and if that be the case it might be suffered, in regard to them, to remain as it is: although I greatly mistake the condition of that part of our State between the head of navigation and the north western limit of our highly improved valley country, if the people would not be nearly, or quite as much benefited as ourselves by the change. I would be among the last men in Virginia to advocate any alteration of dubious policy, in a general law; or that did not, in fact, promise most manifestly to benefit a very large majority of our fellow citizens. But in this case there seems to me not a shadow of doubt on any point involved in the proposal, it being one which requires only to be made, to gain numerous supporters. That it may meet not only your approbation, but that of all your subscribers, is the earnest wish of

Yours, with much esteem,

JAMES M. GARNETT.

TO THE LEGISLATURE OF VIRGINIA.

The Petition of sundry citizens of Essex, respectfully showeth—

That having become thoroughly convinced of the daily increasing necessity for some change in our laws relative to enclosures, we have at last determined to apply to you, as our only hope, for some remedy of the existing evil. That this determination may not appear to have been made either hastily, or from considerations merely selfish, your Petitioners beg leave to state the chief reasons which have induced them to adopt their present course.

In the first place, the law of which we complain is a palpable violation of all other laws relative to property, which principle is, to compel every one "*so to use his own, as not to injure that which belongs to another.*" But the law of enclosures actually *permits* us to injure others by means of our stock, unless *they* make a fence of a certain height to guard against those very injuries which justice demands that the perpetrators should be prohibited from committing under any circumstances. Instead of compelling *stock-owners* themselves to restrain their stock from depredating upon other people's lands, which the above cited principle clearly enjoins, the *land owners* are forced to protect both it and its products, at an enormous expense of extra fencing—or, to suffer without the smallest compensation, all the losses they may incur from the want of this extra fencing.

In the second place, we complain of this law, as the very unnecessary cause of more quarrels—more ill-will—and more lasting animosities between individuals and often whole families, than any other law in our whole code: indeed, we believe it may be truly said, of more than all the others put together.

Lastly, it imposes upon every land owner and cultivator a far heavier tax than all his other taxes united; and what makes the matter much worse is, that not a cent of it goes into the public treasury; but is utterly wasted and lost, inasmuch as it consists in the extra labor which each has to bestow on his own enclosures to protect their products from other people's stock. This legal oppression is greatly aggravated by the fact, that the small land owner—the small cultivator—in other words, the poor farmer, suffers much more in proportion to his property than the rich one; for having to fence it in, and daily to watch it, so as to guard against every other person's stock, and being in general, not so well provided, as richer land owners, with a proportionate quantity of labor, more of his precious time must generally be spent in making such enclosures as this most unjust and oppressive law prescribes, to say nothing of the time lost in repairing and supervising the whole. We may venture to say that this time, upon an average, amounts to two months in every year, and that it certainly could be abridged one month or more, thereby saving at least one-twelfth, or more, of the whole labor bestowed throughout the State, *in the single business of fencing*, if the law on this subject were exactly the reverse of what it is. Compel each person so to take care of his own stock as to prevent their injuring his neighbors' property, and not a cultivator of land in our whole community, whether he be proprietor or mere tenant, but would be thoroughly convinced in less than a year, of the immense advantages of the change. Indeed, we know no reflecting persons any where, with whom we have conversed on this subject, who do not admit the truth of the foregoing arguments.

Your Petitioners beg leave further to represent, that the circumstances of the country when this law was passed, having entirely changed, the law itself cannot now be justified, if it ever could be, even on the score of policy. We have no longer (at least in the tide-water part of our State) extensive tracts of uncultivated, unenclosed lands

deemed of little or no immediate value to the proprietor: fencing materials are becoming comparatively very scarce, and thereby the actual expense of labor in collecting and applying them has been enormously enhanced, while the products of our impoverished fields can very illy sustain this most unnecessary deduction from their net proceeds: add to this, the opinion is daily gaining ground, that even uncultivated lands will much improve by excluding every kind of stock from them. All these circumstances combined, render legislative interference imperatively necessary; for the evils enumerated admit of no other remedy. They have prevailed so long indeed, as to give rise to notions in some parts of our country, relative to landed rights, which, if general in regard to other rights, would reduce us nearly to a state of nature. These notions make all land, not actually cultivated in some crop, a species of common property, free for all who choose to turn their stock on; and this too, whether they be under enclosure or not. Now, if our lands be really our property, it follows as a necessary consequence, that each land owner has an indisputable right to the exclusive possession as well as use of it, and a just claim to protection therein by the laws of his country. This is a universally admitted fact as to every other species of property—why not then, in regard to land also? When we rest our horses to avoid wearing them out; when we lay aside our clothes for the same purpose, he who takes and uses either without our knowledge or consent, may not only be prosecuted and punished by law for such act, but incurs the risk of being utterly disgraced by it. Yet, when we rest our lands to avoid wearing *them* out, and in hopes of improving them thereby, which we have an equally clear right to do, free from all interruption by others, we are compelled by the existing law of our State to keep an enclosure round them of a certain height, or any other person's stock may depredate upon them the whole year round, even if in cultivation, without our being able to obtain the slightest compensation whatever for such depredation: nay, if any injury be done to the trespassing animals, their owner may recover damages from the cultivator of the land, although the land itself, and every thing growing on it, in the language of the law, is styled, as if in mockery, "*his property!*"

These, may it please your honorable body, are crying evils,—of legislative creation too! and for whose benefit, we would respectfully inquire? For none whatever, but that very small portion of our community who may attempt to raise stock without sufficient means of their own to support them. This attempt the present law sanctions as fully as if it conferred the privilege in direct and express terms: sanctions too, without the least cost whatever to the stock-owners, while it compels all the planters and farmers throughout the State, annually to increase their labor—at the smallest computation, *one-twelfth*, if they would guard themselves against injuries which this law of the land empowers others to inflict on them with entire impunity. We venture to affirm that the code of no civilized nation on earth can show an instance of so very small and doubtful a benefit accorded by legislative enactment to the few, at so great and certain expense to the many. Indeed, we think it susceptible of the most satisfactory proof, that much more stock, and of far better quality would be raised than at present, if the law were changed, as we pray that it may be. Such would be the sure result of applying *that labor* which each cultivator would save from fencing out other people's stock, to making more food for his own, and taking better care of them. He would have at least one-twelfth more time to devote to the profitable employment of improving and cultivating his land, instead of spending that twelfth, as he now does, in the *unprofitable* occupation of extra fencing. Though last, not least, the peace, comfort, and harmony of every neighborhood would be incalculably increased by removing forever, this most copious, most pernicious source of contention and animosity. Make it, therefore, we intreat your honorable Body, no longer to depend upon the height of each man's fence whether his neighbors' stock shall be raised upon his lands or not; but let it rest, as it always should do, upon his own free choice, how far he himself will extend the privilege to others. It would often be granted, and would thus prove a bond of union, instead of being what it now is, a brand of continual discord.

All which is respectfully submitted.

ON THE PREVAILING HABITS AND OPINIONS WHICH OBSTRUCT AGRICULTURAL IMPROVEMENT.

To the Editor of the Farmers' Register.

"Am I therefore become your enemy because I tell you the truth?"

Among the various interesting and valuable productions which have appeared in your widely circulating work, I have not seen a solitary one that treats of the fundamental causes which have affected the fertility of our land; and the very many avocations which have been, directly or indirectly, instrumental in preventing, more or less, the regular and systematic course necessary to the improvement of our farms.

Where once stood the majestic oak, the tall hickory, the lofty popiar, and the expanded dogwood, with its beautiful foliage in the opening spring, can now be only seen, in many sections of our State, a wide and extensive view of barren farms with scarcely timber enough to enclose them with fences sufficiently good to keep out the wandering and half-fed stock, which ever are pests to badly regulated farms.

Why this silence on this all important subject? Has false pride prevented the investigation of the causes? Or is it the fear of displeasing some few individuals of different professions that such valuable information is withheld?

Impressed with the fullest belief in the justness of my cause, and under the most anxious solicitude for the restoration of the fertility of our once beautiful and luxuriant fields, I propose to point out some of the most prominent causes of the poverty of our land; also some of the very many impediments to its improvement, and what, in my opinion, is indispensably necessary for us to pursue to improve our land, to increase our products, and to place us in such situation as to lend instead of borrowing money. In the discharge of this duty, *I declare positively*, that I disclaim all personalities; I am laboring for the improvement of the soil of my native State; for the prosperity of agriculture; for a change in our habits of life; for the adoption of a different manner in many cases of raising our

children, educating and settling them in life. But when I come to reflect upon the many *impediments* to agricultural improvements, also to a judicious system of cultivating the soil and the proper arrangement and distribution of labor, adapted to the increase of products, and at the same time to the improvement of our land, I am almost disposed to abandon the undertaking as hopeless and unavailing. However, if I can only suggest one profitable idea upon which others can improve, I shall be fully compensated for my time this hot summer's day.

The time has already come which imperious necessity demands, when the owners of Virginia land, the *Eastern in particular*, should pause—seriously reflect—and minutely examine into the situation of their farms. All the books on farming that ever have been written, all that are now writing, or may hereafter be written, can never avail much, unless there be a complete *fundamental* change in masters of land. Their habits must be entirely *revolutionized*. We must not become masters of our land in every acceptation of the duties of farming only, but we must change the acquired nature and disposition of our children. Early rising and habits of industry must be instilled in them. Let them know that they are not boys when they are really prattling children—that they are not men when they are actually only youths just entered into their teens, and in some instances not more than one dozen years old. Familiarize them to the grunting of hogs, the bleating of sheep, the lowing of cows, and the neighing of horses, that they may not be alarmed at these sounds when they become men. In fact, make more of them farmers and planters.

In the early opening of our land, our forefathers hastily cleared only enough to give them two, and sometimes only one shift, or for one year's working for corn. This was annually kept in cultivation until it became exhausted. Those who had been more industrious and had observed the greater steadiness, industry, and economy, became more prosperous, and consequently more wealthy than those of their neighbors who had pursued a different course. This enabled them to buy from the African trader a "nigger" or two (as Maj. Jack Downing would say.) This filled them with pride, and placed them in their own estimation, above their less fortunate neighbor.

The next thing introduced to the serious and almost inseparable injury of their land, was an individual called by name an overseer. I do not wish to be understood as going to say any thing against the intrinsic worth of these men, or their respectability and usefulness as members of society. Far from it. They certainly constitute a large portion of the "bone and sinew of our country." In peace they are watchful sentinels of our rights, and in war they are ready and willing to march in defence of their country's cause. They make brave and resolute soldiers. The masters, or as I would say, the potentates of their negroes and overseers, looked over with a commanding eye the ideal immensity of their wealth, and the superiority of their own greatness. They commanded their overseers to take their negroes and to cut down and slay annually the very best of their land, regardless of locality and consequences, and to make great crops. While they had such land, they made good crops, and they prospered. Having given up the whole management of their farms and plantations, together with the negroes and every kind of stock, then to amuse their fancy, to improve their understanding, and to show their ideal greatness, they indulged in almost every species of luxury, extravagance, and dissipation. Having entrusted the management of their cropping department, their stock, &c. to overseers, it is but reasonable to suppose that no economy would be used to improve the soil, or increase and improve the stock. Their idle, lazy, and dissipated habits were caught by their children like an electric spark, and even handed down to the *present generation!* I do say without the fear of contradiction, that negroes and overseers are the *proximate* cause of the poverty of our lands, presenting to the weary traveller in many places, an almost interminable view of deserted farms and worn-out fields. If we only would take the management into our *own hands, and personally* devote the most of our attention to the duties of our farms, what a radical change for the better should we not very soon see. In every instance where proprietors cannot devote the necessary attention to farming and to the improvement of their farms themselves, they should employ superintendents, men who will discharge their duty *faithfully*, and for their compensation they should receive salaries in standing wages, instead of part of the crop, which is so commonly given. By adopting this as a general rule, I have no doubt but a considerable change would very soon be discoverable for the better, in every thing relative to the improvement of farms, and in the increase of products. By the adoption of this course peace and friendship will be established between employers and superintendents upon a more firm and lasting basis. Ditches will be kept open; red gullies filled with improving materials; farm pens better attended to; stock of every description increased in valuation, without incurring the displeasure of superintendents. It is not reasonable at all to believe, that any superintendent of a farm can feel much, if any, interest in the above requisites, who receives only for his services part of the corn, tobacco, cotton, and wheat. In this section of the State, *tobacco is the hobby*. This must be made regardless of all neglect and injuries of any or of all other commodities. All who continue to make this article as they have heretofore done, by the neglect of the grain crop, may never expect to see their plantations improving, and their declining years soothed and comforted with plenty of cash. Then make your tobacco ground rich, plant fewer hills, and by so doing, you will be enabled to work it better, manage it with less labor, and surely it will be of better quality, and will command higher prices than if you have double the number of hills half cultivated, and badly managed. The extra labor can be advantageously bestowed on the grain crop, from which you may raise your own pork and your own horses, without depending upon other States for a supply. All this must be done before you can deserve the appellation of good managers and prosperous cultivators of the soil.

We should teach fewer of our sons the syren song of being made members of the three learned professions, (misapplied terms now-a-days I think) viz: law, medicine, and divinity. I wish to say nothing at all in disparagement of these professions, properly so called. They are deservedly

respectable, and cannot, and certainly should not be dispensed with: yet it has become alarming to see their annual increase. At our County Courts we can scarcely get to the clerk's table to have a deed recorded, or a will proven, for the multiplied number of lawyers standing around, occasionally making a five dollars motion.

Second in order stand the doctors. Their number has increased within the last fifteen years several hundred per centum; much more rapidly in proportion than the population of the United States. Many of the States are furnishing medical schools, with cheap facilities for the acquirement of this kind of knowledge. The last annual report from the different medical schools, proves most conclusively how much this branch of science is overdone. It seems those who practice the cheapest and wait the longest are the cleverest and most approved sons of old *Hippocrates*. I should perhaps be accused of unpardonable neglect, if I were not to take a passing notice, and add to the list of doctors another class of men calling themselves *Thomsonians*, together with the *poison curers* who are dabbling into the various and different diseases of the human system. These self-styled doctors can, and I understand do, buy their education for twenty dollars, and then be made *approved* practitioners from one night's reading by torch light. How cheap! What an invaluable discovery in modern literature! How soon impaired fortunes can be restored, if plenty of patients could be found!

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In conclusion, I shall say something of another class of men called merchants. These men are highly respectable, intelligent, and very useful members of society. Their avocation cannot be dispensed with any more than the three learned professions, and surely commands as much respect and attention as either of these professions. But they have become too numerous for all to make fortunes, unless the farmers and planters are seriously injured or ruined. I understand merchants are men who sell goods, wares, and merchandize. But how many who call themselves merchants do not deserve that name in the proper acceptation of the term. This class of men cause more injury to agriculture, and produce more poverty and wretchedness in society generally, than any people in existence. When times are good, as are commonly called, these men are seen erecting shops at the forks of almost every public road, selling by jugs, bottles, and half pint cruets the meanest whiskey and northern rum, together with a kind of drink, they improperly call wine, the composition of which is made of ingredients of the most unhealthy kind. These establishments soon attract the attention of their respective neighborhoods, and call together large groups of men from their daily labor to drink, frolic and carouse, to the serious injury of their farming interest, and to the ultimate ruin of themselves, their wives, and their children. This is not all: our negroes are corrupted and injured by visiting these establishments. The late law, I am pleased to find, has put a considerable check on the owners of these shops, although not effectually. Before the enactment of this law, many of our slaves had become so corrupted, that it was almost impossible to keep them in subjection. Sunday was the day set apart for the blacks to meet at these grog shops and to have their parties, their games, their mirth and festivities; and really, I believe, if they could only have had as many days as the whites to visit these hot beds of corruption, they would have equalled, if not excelled the white gentry. In every neighborhood where these grog shops have been long established, poverty, wretchedness, and ignorance have been the almost inevitable consequences. They have indirectly produced more deaths, not to speak of misery and concomitant evils, than all diseases from other causes which afflict men of years. The great and good man Dr. Rush said, "every disease has its antidote. It is only necessary to discover and administer it;" and I do say it is my belief, that these establishments (grog shops) have their antidote in the steady, judicious and persevering encouragement of the Temperance Society. Members of that society, I would advise you to pursue with unabated industry and perseverance the cause which you have so benevolently and praiseworthily undertaken. Men must however, be persuaded, not forced into the propriety of your cause. Although thrice armed is he whose cause is just, yet much patience, much forbearance, much moderation, and no inconsiderable firmness, are necessary. By your good *examples* united with mildness of conduct, and persuasion of argument, I entertain no doubt but the time is not far distant when a really old toper will be almost as difficult to find, as it is difficult for us at present to agree one with another in the selection of the man to be our next president.

I could name many other avocations of men wherein there is too much opposition, even to the serious and almost ruinous effects of carrying on competitions, and to the neglect and abandonment of the cultivation of the soil. It will be admitted that every person who is attached to any profession more than that profession wants, not only proves injurious to the individuals engaged therein by creating a losing competition, but is actually taking so much talent, labor and wealth from the cultivation of the soil. The great *desideratum* then should be, to equalize the different and various professions, so as for all to prosper and obtain a comfortable support for ourselves, our wives, and our children.

Knowing so well the constituent principles of the human mind and its great aptitude to misconstrue and misrepresent from *interested motives*, I think it highly probable that some few, very few I can but think, of the different professions of which I have taken a cursory view, may take exceptions. I again repeat that I disclaim all personalities. I am laboring solely for the prosperity of agriculture.

P. W. HARPER.

Green Field, Nottoway, Aug. 12, 1834.

RAISING CREAM BY HEAT.

From the Maine Farmer.

I am inclined to think that a communication on the mode of raising cream by heat, for dairy purposes may be of service.

There are two important points gained in the making of butter with the cream prepared in this way, viz:—Economy of time, and an increased quantity of butter from the cream prepared in this way. Fewer pans are needed, and of course few-

er to buy and wash, while the time saved in churning is very remarkable.—I think from the experience that I have had from my own cows, there is a gain of about 25 per cent. of butter. The process is simple.—Pans of a proper size will hold about a pailful; those I have, are made of zinc, being more durable and not much more expensive. When the cows are milked, the milk is strained into the pan or pans and allowed to stand twelve hours. The pan is then placed upon an iron frame, over well burnt coals, where it must be carefully watched, and on the appearance of the first bubble, taken off the fire; and after standing twelve or fourteen hours, according to the weather, the cream may be taken off, and then if sufficient cream is collected, churned.

When the butter is formed, the butter-milk is drained off—cold water is put into the churn—worked well with the dasher—and renewed until it comes out clean. By this process the hand is but little used.

N. B. The surest way of discovering the first bubble is, when the cream is well risen, to open the cream or pass a pin through it in the middle of the pan, and the first bubble that appears there, will indicate the proper time to remove it from the fire.

Your obedient servant,

CHARLES VAUGHAN.

ON AN IMPORTANT RESULT OF AN EXPERIMENT IN THE CULTURE OF POTATOES.

By the Rev. James Farquharson, of Alford.

From the Prize Essays and Transactions of the Highland Society of Scotland.

I am not aware of any experiment having been made, similar to the one I am now about to describe; and as the result of that has turned out to be important, in a practical view, it may not be unworthy of the notice of the Highland Society.

I had not the merit of devising it, for it was first made by my servant. In the year 1824, at the time of hoeing the potato crop, I observed thirty or forty plants, in part of one drill, so greatly superior to any other in the field, that I became desirous of knowing the cause, and on inquiry of my servant, he gave me the following account. At the time of planting, the potatoes cut for plants had become exhausted, before the prepared ground was all planted, and he had carried some whole potatoes to be cut by the planters in the field. Observing among these several potatoes of large size, he had, with his own hands, planted thirty or forty of these uncut and together in one drill, which he had marked, to see whether the produce would be large potatoes. They received no additional manure, and were planted, in all respects under equal circumstances, and at equal distances with the other plants in the field.

I observed that these plants maintained a great superiority in all stages of their growth, and obviously attained a state of full ripeness before any others. At the time of digging them, in autumn, their produce was carefully attended to, and found to be in a remarkable degree superior in the weight of crop and largeness and uniformity of the potatoes.

In the succeeding season I ordered the experiment to be renewed, on as large a scale as my field admitted of, and varied, by planting the greater part of the field with cuts of large sized potatoes, and some drills with uncut large ones, and others with small ones uncut and cut.

I regret that I did not keep any note of the weight of the crops raised after the several sizes, the experiment being intended at the time solely for my own information; but the increase in weight after the large potatoes, both cut and uncut, was exceeding great. I have since adopted the practice of planting cuts of large sized potatoes only; and can now state it as a proposition universally true, that the produce of large tubers is much more abundant, more uniform in size, and considerably earlier than that of small tubers, under equal circumstances of soil and planting.

It will be objected to the system of planting large potatoes, that if we gain a greater weight of produce, we have previously put a greater weight of plants into the ground. But the additional weight of the plants bears only a small proportion to the additional produce; had it been otherwise, I should not have deemed the experiment worth reporting. The fact is, that the additional produce, when large tubers are exclusively chosen for planting, may amount to two or three times the whole weight of the plants.

I have been enabled to turn the result of the above experiment to account, in extending to culture in the field, an early variety of the potato, which I got in 1826.

In that year I purchased for trial small quantities of several varieties of potatoes, recommended each for some particular quality, and announced for sale by a seedsman. I did not find any of these worthy of being continued in cultivation, excepting an early one, with which I got no name. It ripens about a month before the white kidney, has a very good flavor for the table, and preserves its good qualities after being pitted through the winter, a thing not common in early varieties. Its imperfections, when I first got it, were, that the tubers were small, and weight of crop inferior, which, although not making it objectionable as an early garden potato for the table, unfitted it for field culture for the cattle.

As in this country (upper district of Aberdeenshire) our common field varieties of the potato are liable to have their tops smitten by incidental hoar-frosts in the months of August and September, before they are fully ripened, and thus to be much deteriorated in quality, and often rendered deficient in quantity, it occurred to me, that it might be an object worth attaining, to increase the size and produce of this early potato, by the means indicated by the above experiments; when, if this could be done, we should have a good keeping potato adapted for field culture, and ripening early enough to escape the frost.

By a careful selection of only the largest tubers for plants, for a succession of years, this object has now been satisfactorily accomplished; and for the last two years the half of my field potatoes, raised for the cattle and poultry, has been of this variety, and has given a weight of produce, ripening very early, scarcely, if at all, inferior to that of any other variety formerly in cultivation in this neighborhood.

Alford, September 26th, 1833.

REPORT OF THE RESULT OF EXPERIMENTS ON FEEDING TEN HORNED CATTLE, AND AN EQUAL NUMBER OF HOGS, ON RAW AND ON PREPARED FOOD.

By JOHN BOSWELL, Esq. of Balmuto and Kingcausie

From the Prize Essays and Transactions of the Highland Society of Scotland.

[Subject continued from No. 4, Farmers' Register.]

The reporter conceiving the knowledge founded upon the result of an accurately conducted experiment as to the comparative profit of raw or prepared food, to be a matter of much importance to the farmer, determined on setting about the investigation of the subject with all the care and zeal in his power; and accordingly, on the 15th October 1832, selected ten cattle, which were inspected by Mr. Blackie and Mr. Walker at Kingcausie on the following day. They were all dun, horned, and not only of the same breed, but perfectly alike, and almost all got by the same bull,—the weight of the lot to be put on raw being 183 stones 11 lbs. Dutch, the lot to be fed on prepared 179 st. 10 lbs. Dutch.

The food, it may here be mentioned once for all, was from first to last yellow bullock turnip, without any leaves or roots, and round red or pink potato commonly called Perthshire reds. The cattle being all exceedingly tame and quiet, took to the raw food at once, but those which were put on the steamed food hardly tasted it for several days, so that by the 18th they had a very jaded appearance; nothing, however, was given to them but fresh steamed food, the stalls being carefully cleaned every twelve hours, and the stale stuff given to the pigs. A few of them took to it, and in a short time they all seemed to relish the prepared as well as the raw, although it was a fortnight before they looked so full and well as the cattle fed on raw food. The feeder (who had the charge of both lots) was directed to put the raw turnips and potatoes into the stalls at the same time, when the potatoes were regularly finished before one turnip was tasted. On the other hand, the lot on prepared food picked out the steamed turnips in preference to the potatoes.

As the reporter is aware that minuteness will be expected, he may here state that the turnips and potatoes for the prepared lot having been weighed, were very slightly washed, and the turnips were thrown into the hopper of a slicer, and cut into pieces about half an inch thick, after which they were put into the receiver of a steaming apparatus, such as is described by Mr. Spears in the Quarterly Journal. The potatoes, also when washed, were thrown into another receiver. When the steam was fully up, so as to lift the safety valve, the cocks were turned, and in fifteen or eighteen minutes they were ready to be thrown into one large tub to cool, previous to being carried to the cattle. During the time the turnips and potatoes are subjected to the action of the steam, large quantities of water are partly given off and partly condensed, owing to the low temperature of the raw food, so that the receiver would soon get (in sailor's phrase) "water logged," if the attendant did not every few minutes pull out the plug, and empty the space which is between the false and real bottom of the receiver. This water, or rather liquor, from the turnip receiver, has a most agreeable sweet smell and taste, and this the feeder drew off regularly during the whole course of the experiment, and threw into the food tub. That which flowed from the potatoes, although it had no unpleasant taste or smell, being rather sweet, yet as there exists a strong prejudice against potato liquor, was suffered to run off into the grating. The winter was now advancing, the cattle improving steadily and well, and both lots keeping nearly alike, the only difference being, that the lot on raw consumed much more food than those on steamed. As to fodder, the straw during the first month, and the hay for the remainder of the time, appeared to be the same. The reporter says appeared, because, although the quantity given to each was weighed, and that was the same, yet every one knows that the fodder is pulled about by the cattle and a portion always lost, but no difference could be observed. Twice a-week, on fixed days, both lots got a small quantity of the tops of common heath, which acted in the way of preventing any scouring; in fact, turnip cattle seem very fond of heather as a condiment, and there never was any purging amongst the cattle under this experiment. The dung of the steamed lot was from first to last in the best state, without the least appearance of purging, and was free from that abominable smell which is observed when cattle are fed on raw potatoes, or even when a portion of their food consists of that article. Another fact was observed, that after the steamed lot had taken to the field, they had their allowance finished sooner than the raw lot, and were therefore sooner enabled to lie down and ruminate. The accompanying papers show that the food to both lots was proportioned to what the cattle would eat; and the statement of Deacon Williamson certifies that the two lots were exactly alike both in weight and quality after they were slaughtered.

The reporter has now to state what took place with regard to pigs. Being anxious that there should be no interference as to food or any other circumstances, he preferred conducting this experiment apart from the other, and therefore, on the 1st December 1832, caused his overseer at Balmuto to put up ten pigs, all of one litter, in two lots, which, by a little management, he succeeded in getting exactly of the same weight, the lot to be put on raw food being 5 cwt. 2 qrs. 22 lbs., the lot to be put on prepared food also 5 cwt. 2 qrs. 22 lbs. The food employed was round red potatoes and the best oat meal. Those on raw food had the oatmeal given them in the shape of "crowdy," *i. e.* the oatmeal mixed up with a little cold water. The lot on prepared food had the potatoes boiled and the oatmeal made into common water porridge. From the very first it was clear that the lot on the prepared food were fast beating the others, and an increased quantity of oatmeal was given to the lot on raw, in order to make them ready for sale along with the others; yet still, as may be seen by the documents herewith given in, they were greatly deficient on the 1st March, at which time the experiment being concluded, they were put on prepared food, when they began instantly to mak up the "lee-way.

In conclusion, the reporter has to make the following observation:—It appears that it is not worth the trouble and expense of preparation, to feed cattle on boiled or steamed food, as, although there is a saving in food, it is counterbalanced by the cost of fuel and labor, and could only be gone

into profitably, where food is very high in price, and coal very low. It must, however, be remarked, that the winter 1832–33 was a remarkably mild one; on the contrary, had it been very frosty and cold there can be no doubt the cattle on raw food (with, every care) would have fallen back; and lastly, that there cannot be a doubt that in the feeding of swine prepared food is the best.

[By the accompanying certified statement, it appears that, of the cattle, Lot 1, fed on raw food, the weight was 183 st. 11 lbs. Dutch, while that of Lot 2, fed on steam food, was 179 st. 10 lbs.; but the weight after the experiment is not mentioned, it being only stated in general terms, by Mr. James Williamson, who purchased the cattle, that, on killing them, he "took particular notice of the quality of the beef and weight of tallow in each lot, and found them, to the best of his judgement, to be perfectly alike."

The cost of keeping the five cattle on raw food amounted to £32 2 1, while that of the cattle on prepared food was £34 5 10, there being a balance of £2 3 9 in favor of the raw food.

With respect to the pigs, it appears that the five put on boiled food weighed at the commencement of the experiment on the 1st December 5 cwt. 2 qrs. 22 lbs., and at its termination on the 1st March 10 cwt. 1 qr. 1 lb.; while the five fed on raw food weighed at these different periods 5 cwt. 2 qrs. 22 lbs., and 8 cwt. 1 qr. 15 lbs., leaving a very decided difference in favor of those fed on prepared food. The expense in the case of the latter was £6 19 4½, and in that of the pigs fed on raw food £5 8 6, so that the profit was after all inconsiderable.]

REPORT OF EXPERIMENT OF FEEDING PIGS ON RAW AND STEAMED FOOD.

By Mr. Robert Walker, Ferrygate, Haddington.

From the Prize Essays and Transactions of the Highland Society of Scotland.

We put up to feed, on the 4th March 1833, five pigs on steamed potatoes, and five on raw potatoes, with an allowance of 2½ lbs. of broken barley each lot, the barley, for the steamed lot, being steamed along with the potatoes. They were allowed the same quantity of potatoes, but, from the circumstance of their being, when put up, only 2½ months old, and from the same brood, we were not able to keep so accurate an account of the quantity of potatoes consumed; because as they increased in size, they ate more potatoes.

The following Table will exhibit the improvement in pounds weight.

1833		Weight in lbs.
March 4.	Live weight of five pigs, on raw food,	108
	Ditto of 5 ditto, steamed food,	106
	Difference in favor of raw food,	2
19.	Live weight of five pigs, on steamed food,	114
	Ditto of five ditto, on raw food,	111
	Difference in favor of steamed food,	3
30.	Live weight of five pigs, on steamed food,	137
	Ditto of five ditto, on raw food,	123½
	Difference in favor of steamed food,	13½
May 1.	Live weight of five pigs, on steamed food,	205
	Ditto of five ditto, on raw food,	176
	Difference in favor of steamed food,	30
June 1.	Live weight of five pigs, on steamed food,	279
	Ditto of five ditto, on raw food,	223
	Total difference in favor of steamed food,	56

In the three months, the pigs on steamed food have increased 173 lbs., being 67 lbs. more than double; while those on raw food have only increased 115 lbs., being 7 lbs. more than double their first weight, so that there can be very little doubt that steamed food is more profitable for feeding pigs than raw food. In fact, the reporter does not think it possible to make pigs fat on raw potatoes, without other food, when confined to them alone.

ON THE IMPORTANCE OF LIQUID MANURE IN HORTICULTURE, AND THE PECULIAR ADVANTAGES OF SOOT AS AN INGREDIENT FOR THAT PURPOSE.

By Mr. John Robertson, F. H. S. Nurseryman, Kilkenny.

From the Gardener's Magazine.

Amongst the many advantages which horticulture has derived from Mr. Knight's enlightened application of science to its practice, we may reckon as not the least important, his earnest and repeated recommendation of liquid manures. In general, liquid manures have not had that importance attached to them by gardeners which they merit. They may at all times be resorted to with advantage; but, in a number of instances, and particularly where immediate effects is required, no other manure can be so well applied. To enumerate their uses and preparation, however, would demand more consideration than I am enabled to bestow;—my present object being solely to point out a material for the purpose, which I have long availed myself of with success, though it seems to have been overlooked by most gardeners—it is soot.

Sir H. Davy characterizes soot as "a powerful manure, possessing ammoniacal salt, empyreumatic oil, and charcoal, which is capable of being rendered soluble by the action of oxygen, or pure vital air;" all which component parts rank high as nutritious or stimulant manures. On meadows I have used soot with great advantage in substance, and though sown by the hand, one dressing gave me always heavy crops of hay for two successive seasons; but this is a wasteful mode of applying it, a great proportion of its ammonia, one of its most active ingredients, being volatilized and dissipated in the atmosphere. When dissolved in water there is no waste:—it is all available, and for horticultural purposes I have mostly used it in that state, mixing it up in the porportion of about six quarts of soot to a hogshead of water. Asparagus, peas, and a variety of other vegetables, I have manured with it with as much effect as if I had used solid dung; but to plants in pots, particularly pines, I have found it admirably well adapted: when watered with it, they assume a deep healthy green, and grow strong and luxuri-

ant.—I generally use it and clean water alternately, and always overhead in summer; but except for the purpose of cleaning, it might be used constantly with advantage; and though I cannot speak from my own experience, never having had either scale or bug on my pines, (pine apples) yet I think it highly probable, as the ammonia it contains is known to be destructive to these insects in a state of gas or vapor, that in a liquid state, it does not totally destroy them, yet that it will in a great degree check their progress.

Other materials for liquid manures are often difficult to procure, and tedious in their preparation: but soot, sufficient for the gardener's purposes, is almost every where at hand, and in a few minutes prepared.

Were gardeners more generally aware that no manures can be taken up in a state of solidity by plants as food, and that they can only be absorbed by them in a gaseous or liquid state, to which all solid manures applied must be previously reduced, before any benefit can be derived from them, they would in many cases facilitate the process by using them *in a liquid state.* In houses (green and hot houses) where the rains have not access, it appears to me superior to any other mode of administering manures to trees.

Kilkenny, Aug. 24, 1826.

Quere.—Has any system been adopted for collecting at one or more deposites the soot of this and other large cities? Might it not be easily done through the superintendents of chimney sweepers?

ON PROVIDING SCHOOLS FOR THE INSTRUCTION OF FARMERS' SONS IN THE PHYSICAL SCIENCES.

By Mr. William Hawkins, Hitchen, Hertfordshire

From the [British] Quarterly Journal of Agriculture.

It is the object of this paper to recommend the establishment of schools throughout the kingdom, for teaching farmers' sons the elements of the sciences; such, for example, as Chemistry, Vegetable Physiology, and Mechanics. And, in the progress of it, I shall endeavor to show, first, the usefulness of such knowledge, and then the method by which it may be generally diffused; and I think I can make out both these points to the satisfaction of any body who will take the trouble of attending.

To prove the importance of agriculture to a community, seems very like demonstrating the advantage of having food to eat and clothes to wear. That it is indeed "the first and greatest concern of every nation, and the foundation of its prosperity in every other matter," is a truth so universally acknowledged, that it has obtained almost the currency of a proverb. But in spite of this general recognition of its supremacy, a due proportion of human ingenuity has never been directed towards the investigation of its principles. The mechanical arts have been carried to a high degree of perfection by the labor and genius of such men as Watt and Arkwright, and in every town we see rising round us institutions for the education of mechanics. But what, of a similar nature, is being done for agriculture? We may look in vain for the institutions which should diffuse among practical farmers even that knowledge which already exists. The principles of agriculture may have been explored by the genius of Davy, and its practice reformed by the labors of Young, but discoveries and experiments can be useful only as far as they are known. Mr. Tennant has shown how the farmers in the neighborhood of Doncaster might have told that there was magnesia amongst their lime-stone, and that consequently it would be injurious to the soil; that is to say, he knew these things himself, but of what use were his experiments to the Doncaster farmers, who never heard of them, nor perhaps of him either? It is said that vaccination was known in a district in Gloucestershire before the time of Jenner, but how did that avail those who were dying of the smallpox in London? The barrenness of the hills in Westmoreland will be remedied, when, not the chemists and the vegetable physiologists of London or Paris, but the tenants and occupiers of those very hills shall understand its causes and its cure. At present the means of diffusing scientific knowledge amongst them are extremely limited, and the general establishment of agricultural schools would have for its object the conveyance of knowledge to the place where it is wanted, in a manner perfectly analogous to the ingenious contrivances by which water is conveyed from the reservoir at Islington to the houses of the inhabitants of London.

But, it may be asked, shall chemists and recluse philosophers presume to teach farmers how to farm? Is it not to be supposed, that men who have passed their whole lives in that pursuit, understand it better than any body else? Most unquestionably they do. Sir Humphrey Davy would, most likely, have made a bad farmer. There are a thousand important considerations connected with farming, of which he was probably ignorant; but still he ascertained, in a manner clearer than had been done before, the principles which regulate the application of quicklime as a manure. And it does so happen, that many of our useful discoveries have been owing to men not connected in practice with the art to which their discoveries were applicable. Arkwright was a barber, Dollond was a silk-weaver. The compass, the chronometer, and the weather-glass, three of the greatest helps to navigation, were all discovered by landsmen. Gunpowder is supposed to have been first found out by a monk.*

Put into another shape, the possibility of progressive improvement in agriculture may be a little more palatable. The farmers in France obtain from a soil at least as fertile as ours, no more than 18 bushels of wheat per acre on an average. Is this because they have less experience or less skill and knowledge than ourselves? And if one of us should undertake the thankless task of pointing out to them their errors, he might count upon being laughed at for his pains,—for presuming to know better how to farm their lands than they who had been at it for generations.

Amongst the many helps towards a more perfect knowledge of external nature which the mind

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* "'How came priests and bishops, and please your honor, to trouble their heads so much about gunpowder?' 'God knows,' said my uncle Toby, 'his Providence brings good out of every thing.'"

of man has discovered in these latter days, the first place is due, by general consent, to

Chemistry.—The efforts of the farmer are chiefly directed towards making land more fertile; and the first step in this process is to inquire in what particulars less fertile land may differ from that which is more so; to compare the two together; to find out the ingredients of each, and the proportions in which they are mixed. The knowledge how to do this is Chemistry. Arguments upon particular cases are commonly more intelligible than abstract reasoning; and it may therefore be advisable to select an instance. The following is from Sir Humphrey Davy's Agricultural Chemistry.

He says, "a soil of good apparent texture from Lincolnshire was put into my hands by Sir Joseph Banks, as remarkable for sterility. On examining it, I found that it contained sulphate of iron, and I offered the obvious remedy of top-dressing with lime, which converts the sulphate into a manure."

Now, what is the process by which, as we may suppose, Sir Humphrey Davy arrived at the knowledge that the difference between this barren soil and other soils of the same appearance, consisted in its containing sulphate of iron. By previous instruction, he had made himself acquainted with the nature of soils in general, and with their most usual ingredients, and he proceeded to test for them, one after another, until he threw in the reagent, which forced the latent mischief to show itself.

For the sake of perspicuity, let us suppose that of the many substances in nature, which may not improbably exist in a soil (and the presence of either of which would lessen its fertility,) the four following are supposed to be the most probable.

1. An alkali.
2. An acid.
3. Magnesia.
4. Sulphate of iron.

Any vegetable blue, such as the infusion of violets, would be a test for the first two substances. The infusion would turn green if an alkali, and red if an acid, were present. The presence of magnesia would be indicated by its slightly effervescing when plunged into an acid, and by its rendering diluted nitric acid milky. If, by these applications, it should be decided that neither of the first three ingredients existed in the soil, the next point would be to inquire as to the presence of sulphate of iron. It might be difficult, it might perhaps be impossible, for the eye or the hand to perceive it; but, if it existed, a few drops of the infusion of galls, poured into a wine-glass containing a small portion of the earth dissolved in water, would cause the mixture to turn as black as ink, and it would in fact be ink; for sulphate of iron and galls are the materials of which ink is commonly made. And all this is very easily done; it might be performed by a child. All that is required is, that a few ounces of the soil should be brought home, and, at each experiment, a teaspoonful of it put into a wine-glass, and a table spoonful of the test-liquid poured upon it.

By means as simple as these, a man may tell what ingredients go to the composition of any soil that he may wish to examine, but it requires a little more trouble to ascertain the proportions in which these ingredients exist; and the barrenness of a soil may be owing to the excess or deficiency of an ingredient not less than to its absence or presence. A chemical analysis of soils, however easy to those who have been regularly taught how to conduct it, could scarcely be performed by those who had not; and few men can be brought to give these things sufficient attention after their school days are over; for which reason it is particularly desirable to have them taught in youth,—"in the morning of our days, when the senses are unworn and tender, and the gloss of novelty is fresh on all the objects which surround us."

"The instruments required for the analysis of soils are few, and but little expensive. They are, a balance capable of containing about a quarter of a pound of common soil, and capable of turning, when loaded, with a grain; a set of weights from a quarter of a pound troy to a grain; a wire-sieve, sufficiently coarse to admit a mustard-seed through its apertures; an argand-lamp and stand; some glass bottles; Hessian crucibles; porcelain or queen's ware; evaporating basins; a Wedgwood pestle and mortar; some filters, made of half a sheet of blotting paper, folded so as to contain a pint of liquid, and greased at the edges; a bone knife, and an apparatus for collecting and measuring aëriform fluids."—*Agricultural Chemistry*, 146.

And a farmer need not possess all these things himself. If the proposed schools were established in every district, the apparatus, with the necessary reagents, would be kept at each school, and might be used occasionally by any body: and all he wants for most purposes would be a few acid and vegetable infusions,—a test-box, in short,—with the weights, sieves, lamps, and earthenware used for domestic purposes. And many very important results might be come at by these simple methods.

What can be easier to observe, whether an infusion of any kind turns vegetable blues red or not? But if it does, the infusion contains an acid, and therefore lime, or any alkaline substance, is a good dressing for it.

When a piece of paper moistened with muriatic acid, and held over the steam arising from a dung-hil, gives out dense fumes, it is a certain proof that the decomposition is going too far, for it indicates that volatile alkali is disengaged.

It requires very little labor to observe, whether a soil effervesces by the action of an acid, or whether it burns when heated, or what weight is lost by heat; and yet these simple indications may convey most valuable information concerning the ingredients of the soil.

If the whole case rested upon these instances, there would be little room to fear refutation, for they surely prove the applicability of Chemistry to Agriculture—they prove that many of the causes of sterility, and consequently the appropriate remedies, may be discovered by its aid.

Not that all these instances would be applicable to all soils, but some would apply to one species and some to another, and happy would he be whose land was so good that he could find no fault in it. And it may be repeated over and over again, in favor of chemical analysis, that all barrenness, as well as every other quality of a soil, must of necessity be owing either to the presence or absence—the excess or deficiency—of some element.

Entomology—The Knowledge of Insects.—The first step in proof of the utility of this science, might be to show that insects do a great deal of

harm; but I shall probably be allowed to take that for granted. The destruction of the turnip-crop alone is a very serious national evil. Slugs, grubs, and wire-worms eat the seed in the ground, and other creeping things in the granary. Flies torment the domestic animals whilst alive, and blow their flesh when dead. Caterpillars eat cabbages, and moths riddle holes in cloth. Almost every plant has its insect enemy. Clover-seed is destroyed by a small weevil *(Apion flavi-femoratum;)* Dutch-clover by the *Apion flavipes;* peas in the pod by the small beetle *(Bruchus granarius.)* The wire-worm is the grub of the beetle *(Elater Segetis.)* The turnip-fly is properly a beetle—a little jumping beetle *(Haltica nemorum.)*

The problem of course is how to destroy this legion of enemies. Now, to do this with the greatest effect, we must watch them through all their changes. There may probably be many persons ignorant that most insects pass through four stages of existence, (of which the silk-worm affords a familiar instance;)—1st. The egg—2dly. The caterpillar—3dly. The chrysalis—and, 4thly. The butterfly or imago. It is in the second stage that insects generally do the most mischief. In the egg and the chrysalis they do none; and in the imago, some do and some do not. Though we are all familiar with the insect in the shape in which its ravages compel our attention, we are frequently unconscious of its identity under other shapes. Though our last year's crop was destroyed by the wire-worm, we should probably pass by a swarm of the parent beetle, the Elater Segetis, without being aware of the relationship; and in the same manner we look on the cockchafer, without suspecting that its issue is the grub which eats the roots of the grass. But however desirable a knowledge of entomology may be, no single individual could acquire it all for himself. He would need the eyes of Argus—the patience of Job—and the years of Methuselah. The diligence and sagacity of men who have passed their lives in this study have at length accumulated a body of facts of the highest value; being printed, they have become the property of every body who will take the trouble to read them; and thus a schoolboy may learn in a few months facts which the labors of his whole life might have been vainly exerted in seeking.

Messrs Kirby and Spence are the great authorities upon this subject, and from their book most of the facts here stated have been taken. They themselves suggest a similar application to practice of the truths of their favorite science. "With respect to noxious caterpillars in general," say they, "farmers and gardeners are not usually aware that the best mode of preventing their attacks is to destroy the female fly before she has laid her eggs; to do which, the moth proceeding from each must be first ascertained; but if their research were carried still farther, so as to enable them to distinguish the pupa, and discover its haunts (and it would not be difficult to detect that of the greatest pest of our gardens, the cabbage butterfly) the work might be still more effectually accomplished."

The follies committed for want of a little knowledge of entomology, are well illustrated by another passage of the same authors. "In Germany, the gardeners and country people with great industry gather whole basketsful of the destructive cabbage-moth *(Noctua Brassicæ,)* and then bury them—which is just as if they should endeavor to kill a crab by covering it with water—for many of them being full grown, and ready to pass into their next state, which they do under ground, instead of destroying them by this manœuvre, their appearing again the following year in greater numbers is actually facilitated. Yet this plan, applied to our common cabbage-caterpillar, which does not go under ground, would succeed."

The process of destroying noxious insects by attacking them in their early stages is not new in this country. P. Musgrave collected the chrysalids in the spring, so as to become acquainted with them, and then employed people to catch and kill the moths and butterflies. If you catch 200 in a day, you destroy 10,000 eggs, which would give 120,000 in a fortnight.—Might not boys and girls be well employed in doing this? They have all the organ of Destructiveness.

In short, it is abundantly evident, that if we knew them in all their changes, and know where they are concealed in autumn, winter, and spring, we might exterminate those multitudes which are now as the sands which are upon the sea-shore. And if not all the knowledge required be yet in our possession, a great deal is, and might be easily imparted to the young farmer, if we could catch *him* in his chrysalis state; and what little is still wanting would soon be accumulated when we had set so many keen and interested eyes to observe: a fly could scarcely move but they would be watching him.

The Diseases of Cattle.—This is an important subject. There is no individual of many years' experience in farming, who has not suffered severe losses from the death of horses, cows, or sheep. Diseases amongst sheep are perhaps the most common and the most extensive, and to whom is the cure of them entrusted? Generally to a laboring man, who has not the remotest knowledge of the several organs which compose the animal frame, or of their functions, and whose education has not fitted him to reason correctly even upon the few facts which he knows. What should we think of entrusting our friends or relations in sickness to a man who had studied no more of anatomy or medicine than a shepherd? And the mischief is not confined to their ignorance of the true remedy. Ignorant men are the most irreclaimable theorists. They attribute disorders to the most fanciful cause, and then from their assumed and absurd premises, they argue away to a conclusion as hardily as a geometrician. I have heard many striking instances of this from a friend of mine, who is himself both a physician and a philosopher. One poor patient laid the blame of his sufferings upon a cause which few would have thought of. "Sir," says he, "*it is the wind meeting the disgester;*" and no doubt his remedy would have been to have put some covering round the disgester, to keep the wind away. Another poor fellow was troubled with "*a rising of the lights;*" and being asked whether he had taken any thing for it, "Yes," he said, "*he had swallowed some shot to keep them down.*" And I beg to assure the incredulous, that this is an extremely common disease and remedy in this neighborhood; and these are the very men who prescribe for our sheep! Formerly it was the custom to ascribe diseases to the direct operation of the devil, and of course the

cure was correlevant to the assigned cause. "Touching the heart and the liver, if a devil or an evil spirit trouble any, we must make a smoke thereof before the man or the woman, and the party shall be no more vexed, and the devil shall smell it and flee away, and never come again any more." And the story goes on to say, that in Tobit's case, the evil spirit fled, when he had smelt it, into the utmost parts of Egypt; but I do not suppose that this kind of fumigation would answer now-a-days. But, *revenons à nos moutons*, or rather let us proceed to the horses, with which, indeed, the case is not much better. If you send for a farrier, the message not unfrequently is, that he cannot come to see the horse to night, but that he has sent him a drink, and will come and see him in the morning. Now, try this system by the same test: how would you like it yourself? You are suddenly attacked with a violent complaint, and you send for Sir H. Halford. He never saw you perhaps in his life, and knows nothing whatever about what is the matter with you; but he sends his compliments, and desires you to take a dose of Daffy's Elixir; and if your complaint be what is very common with horses, viz. inflammation of some of the viscera, this dose will probably finish you, as out of all doubt it has finished many an unfortunate quadruped. Not that the absence of the farrier signifies much; he probably does not know a bit the less of the disease on that account. The study of horse-medicine and surgery has no doubt made much greater progress than that of cows or sheep, and some of its professors are men of sense and education, as I am personally able to testify; but how few are they compared to those of an opposite character. It was said, with much point and truth, by an old physician, that in all cases of illness there were three things to consider, —the patient, the disease, and the doctor; and that if any two of them pulled well together, they would be able to beat the third. In the case I have been supposing, it is the disease and the doctor against the patient.

Cows, again, stuff themselves with cabbage, or other succulent food, which by and by ferments and gives out a great deal of carbonic acid gas; the stomach becomes distended, and, if relief be not speedily afforded, the animal dies. Many a valuable creature has perished in this way, whose life might have been saved if the owner had been chemist enough to know what would stop the fermentation, or had been provided with mechanical instruments for drawing off the gas. And these attacks are sudden,—remedies to be useful must be near. There is no time to fetch the doctor, even supposing him to be worth fetching. The owner himself must know what to do, and how to do it. It is not proposed to make every farmer an accomplished surgeon; that would be impossible, but it is not impossible, and it would not be useless, to teach him at school something of the structure and diseases of the animals on whose health his fortune depends; something of the symptoms by which those diseases are indicated, and something of the operation of the most important medicines. Being so constantly slaughtered for domestic purposes, there would never be wanting opportunities of studying their organization. The national gain, by diffusion of this sort of knowledge, would be immense. According to Mr. Colquhoun's estimate, there were in the United Kingdom, so long ago as 1812,

1,800,000 Horses.
10,000,000 Horned Cattle.
42,000,000 Sheep and Lambs.

There are no tables published of sickness and mortality amongst quadrupeds; but out of 53,000,000, the deaths occasioned by disease in the course of a year must amount to an enormous total. In Holland, above 500,000 cattle are known to have died of disease within 20 years. At £10 a piece, this would come to £250,000 a year. The tenth part of one year's loss upon this article of cows alone, would be enough to put into operation throughout the whole kingdom schools, which would create ten times as much wealth annually as was ever lost by the death of cows. If money laid out in diffusing knowledge produced a return of only one hundred-fold, it would be certainly an eligible investment; but a hundred-fold would be little, compared with its eventual products.

Mechanics—the art of producing a given result with the smallest expense of power.—It is very important to make power go as far as possible, because it is the dead weight upon a farm. Horses eat and drink, but produce neither milk nor wool. Perhaps the best way to show the value of this kind of knowledge, is to point out the losses attendant on its absence. Every body must have seen ploughs so ill constructed as to require three horses to draw them through a soil which might have been worked well enough with two in a plough of the improved pattern. Instead of a sharp edge contrived to cut the ground, and a well formed mould-board to turn it over, you may sometimes see a blunt wedge dragged slowly through the soil, to the intolerable fatigue of the cattle, as well as the rapid destruction of the plough and the harness; but little work is done, and that little in an expensive and slovenly manner.* Carts and wagons, too, are susceptible of great improvement; their more common faults are their weight—the friction at the axle, the dishing of the wheels, and the want of springs: the consequence is, that a horse is jaded and knocked up by what would, under more skilful management, have been an easy day's journey. An acquaintance with mechanics would also induce a man to pay more attention to the state of the roads. But besides carts and ploughs, we are every day introducing fresh machinery. We thrash, dress, plant, and sow by its aid, and though of no very intricate construction, these machines are somewhat more so than the old farming implements. The farmer is not to expect his laborers to study

* By the way, it appears to me that an improvement might be made upon the best ploughs now in use. The cutting of the soil appears to be scientifically done; but the clod, when cut, presses with force against the shoulders of the mould-board, and offers considerable resistance to its advance. Evidently the force which turns it over should, if possible, be made to act at right angles with the track of the plough, whereas at present it approaches to the same line. Might not an endless chain, or a horizontal wheel of small diameter, be inserted just at the point where the clod presses upon the mould-board, so as to ease the friction? If the pulverization of the clod be the object, that would be more economically effected by rolling and harrowing afterwards.

their principles, and he is not up to his work unless he can tell whether his tools are well or ill made, and can see the cause of any defect in their workings. If, by a little here and there a man can save the labor of one horse on a farm, it is a great thing. The multitudes of machines which are rising like meteors round us, should, in this branch of science, at all events, unteach us the foolish vanity of supposing our present practices to be the best possible. In the West Indies they are no doubt as well convinced of the excellence of their agriculture as we are, and they have not generally introduced either the plough or the wheel-barrow! My authority for this is the writer of a lively sketch of their manners and customs, entitled "Marly, or a Planter's Life in the West Indies." He says, "after a week or five days of this kind of labor, very distressing to the people, few acres indeed were gone over, although there were rather more than 100 negroes employed, one day with another, digging only these holes in the ground. *Had the ground been previously tilled with the plough*, an amazingly greater quantity of these holes could have been made in one day than it was possible for the people to effect in three or four in the manner in which they worked."—"To carry the manure to the required spot was the task of the negresses, and the weak negroes, who, with some little help at the manure-heaps, had to fill their baskets and then carry them on their heads at a pretty smart pace, and empty them into the holes. This employment of bearing the manure none of the carriers at all relished, but the stimulus of the whip, and the daily encouragement of a dram of rum, effected wonders. *Had the people been furnished with wheel-barrows*, they could have performed their tasks with ease."

It need not be inferred from this, that I suppose our practice to be as faulty as theirs. It is adduced for no other purpose than to rouse people from the lethargic dream in which we are all too apt to indulge, that the established practice is the *ne plus ultra* of perfection.

Accounts.—In a business embracing so many particulars as farming, it is essential to be able to distinguish the profit and loss upon each. Nothing is more easy or more common than for a man who keeps no accounts, to continue for a series of years to lose money upon some particular department without knowing it, or, which is almost as bad, to employ his time and capital in less profitable speculation, when he might have applied them to such as were more so. A farmer grows many sorts of crop, and keeps several species of animals—breeding some and buying others, and uses many kinds of manure. Assuming that he has a general profit of 10 per cent. at the year's end, how is he to tell whether all the branches of his business have contributed rateably to this result—how, I say, is he to tell this without accounts? The cost of one acre of corn, for example, is by no means self-evident; it is "compounded of many simples, extracted from many objects,"—rent, tithe, taxes, seed, and tillage—horses' keep and man's keep—rates for the poor, the church, and the highways—and so with every other crop. Suppose now, that, in the case of oats, all the items of expenditure accurately set down shall amount to £5 15s. an acre, and that the crop shall sell for £5 10s. Upon 40 acres here would be a loss of £10 a-year; but without setting down the several items which compose the cost, and adding them together, how is a man to tell within 5s. what his acre of oats cost him? He may know that his acre cost him *about* £5 or £6, but in this very *about* lies the essence of the mischief. About £5 or £6; now if the selling price were £5 10s., the former supposition would give a profit, and the latter a loss, of £20 a-year; and thus any man may, and multitudes do, continue to the end of their lives carrying on branches of business by which they lose money unconsciously. The same observations apply to manures brought on the farm. Price, carriage, labor, &c. all reckoned, bone-dust may be 5s. an acre dearer or cheaper than stable-dung—but without counting up the cost of each item that forms the price, a man may be ignorant of this difference, and so may lose 5s. an acre. It is by a few shillings gained here and saved there, that a farmer makes his profit. It is no exaggerated estimate to suppose that these petty items may often make a difference of 10 per cent. at the year's end, and that so, one man may make a living on the same farm where another would fail. A knowledge of these details, therefore, is useful, and is to be acquired by a system of accounts. Nearly allied to, if not identical with, accounts, is a facility at all the common operations of arithmetic, and the storing in the mind of certain arithmetical results, which may serve as the basis of future calculations. The multiplication table is a familiar example of the vast importance of this prepared and portable knowledge. The commonest operations of arithmetic could scarcely be carried on without the intuitive readiness with which the produce of any two of the numbers under twelve have been made to occur to the mind; but the principle is capable of an application much wider than it has received. The proportions existing between the numerical parts into which the year, the acre, the pound sterling, and the ton weight are divided, might be impressed on the mind, and, as it were, *burnt in* by continual repetition; as, for example, the weight of an acre of turnips is a fact which it is desirable to know, and which is ascertained in five minutes, if we bear in mind that, for every pound on the square yard, there are 2 tons 3 cwt. 14 lbs. on the acre; and we should in a similar manner be able to tell without effort, what breadth of turnips would keep a sheep or a cow for a year. The number of inches in a square or cubic yard, and of yards in an acre, the number of pounds in a ton, and the proportion existing between the days in the year and the common subdivisions of our measures of weight, capacity, superficies, and value, suggest themselves as instances. A number of these facts and relations being well impressed on the recollection of boys at school, they would come in after life to the calculations necessary to establish knowledge instead of guesses respecting the affairs of their farms, so well prepared as to make that occur intuitively and without labor, which men, not so prepared, could only come at with much labor, or perhaps not at all. There is scarcely any thing easier than the use of logarithms, but we are certainly not all qualified to have invented them.

There still remain other sciences from which instances as pregnant might be drawn. Vegetable Phsiology, Meteorology, Geology, Hydrostatics; but it is not by the endless multiplication of instances that attention can be enchained or convic-

tion adduced, but a sample is intended and not a catalogue. A nosegay may give some idea of the riches of the parterre, and has the advantage of being more portable.

But besides enriching the mind with a store of knowledge positively and actively useful, a course of education such as I have suggested, would, by the inculcation of sound principles, defend the mind from the inroads of many senseless prejudices; for ignorant men are, as has been before hinted, the most inveterate theorists. They will never be satisfied without assigning some cause for the phenomena which they see, and that assigned cause is often not only false, but absurd; and, as the remedies resorted to are naturally correspondent with the supposed cause of a disease, the latter is likely to remain undisturbed, and a new disease to be introduced by the operation of the intended remedy. Apple trees have been cut down, from its having been unjustly supposed that they bred certain insects which did mischief to the corn. Kirby and Spence give an instance of a meadow in which the grass was eaten up by grubs; the rooks were busy in digging for these grubs, of which they happened to be fond, but the owner thought it was the rooks that eat the grass, and he therefore shot them. It is not stated whether he also killed his cat to preserve his cheese from the mice. Bradley, an agriculturist famous in his day, accounted for the blight in the following original manner:—He supposed it to be occasioned by insects which came from Nova Zembla, "*where the cold is intense enough to give life to these small creatures.*" The late Mr. Bakewell theorized himself into thinking, that dung should be dried into the fineness of a pinch of snuff,—"an opinion," says the author of the new Farmers' Calendar, "which I have ever thought absurd and unprofitable in the extreme," and I believe most people will think so too; but even the author of that Calendar is guilty of the following heresy:—He says, at page 158, "it would be wonderful did we not know of the constant recurrence of such contrarieties in agricultural practice, that lime has been often found both of the utmost advantage and perfectly noxious by different cultivators, on soils of *a perfectly similar nature*," which I think "may hardly be, Master Shallow."

A scientific education would, moreover, remove the great gulf which appears to separate every part of the country from every other part; things may be known and done for ages in one place, without their being heard of in another not a hundred miles off. Potatoes were brought into Ireland about 1610, and did not arrive in Cantire, which is a very sandy soil, and where they have since succeeded so well, in less than a century and a half. They had reached Lancashire forty years before they were much planted about London, and then considered as rarities, without any conception of the utility that might arise from bringing them into common use. The cultivation of the turnip was introduced about 1670, but at first it seems to have been overlooked and even neglected for many years, and then again proposed, recommended, and explained with better success.

To put the argument into a different form, let us advert to the introduction of Swedish turnips. Less than 35 years ago, the author of the new Farmers' Calendar was obliged to quote an account of them from the Nottinghamshire report, "being without experience in the culture of this root." And in another place he says, "I hear his Grace the Duke of Bedford has from 20 to 30 acres of the Ruta Baga at Woburn." Now, if this crop had made its way no faster than potatoes, it would not have been heard of over a quarter of the kingdom yet, and there are many farms to whose improved system of husbandry they are essential. It is stated in the History of the Royal Society, that the value of sea-shells as a manure had been known in Cornwall at least as early as 1675, and the process followed had been published in the Transactions of the Royal Society; and yet, in 1744, the use of them was so little understood in Suffolk, that a farmer who found it out by accident, soon realized a fortune by the discovery.

But of proofs and instances *jam satis*. Enough has been said to convince those who are willing to give a peaceable reception to truth,—and this paper is addressed to them only,—and to them I say that we have in this scheme a matter of high import to the nation at large. The universal complaint seems to be, that the people are growing too numerous for the land. No parish but either has, or fears to have, a redundant population;—men, able and willing to work, subsisting unprofitably and uncomfortably upon the poor rates,—this superfluity displaying its effect in diminishing the rate of wages; that, again, followed by distress, and distress by riot and insubordination, and the evil increasing so fast, that it was lately stated by the chairman at the Quarter-Sessions in one of the towns in the south of England, as the result of his calculation, that if things continued to go on for five and twenty years longer as they had done for the five and twenty years past, the poor rates would swallow up the whole rent of the land, so that it would not be worth a shilling to the proprietor. Now, though I do not "go the whole hog" with the noble chairman, I think it cannot be denied that there is something strange in the present position of the country,—in the increase of the people, rapid beyond all former example, and in the more rapid increase of the poor rates. It is an indisputable fact, that the money raised for the relief of the poor increased six-fold in the reign of George III, while the population only doubled; but over-population is relative, and not absolute. It is not to the superficies, but to the consumable produce, of the land that the people are disproportioned. If we can augment its fertility by one-tenth, we in effect add one-tenth to its measurement, and do as much good as if we could recover another Yorkshire from the German Ocean. Supposing the quantity of corn grown could be indefinitely increased, the number of people could never become inconvenient, even though it should increase ten-fold, but manifestly much the contrary. An hundred millions of people would bear with ease the burdens which crush us to the earth. If we can improve the cultivation so fast as to keep ahead of the population, we shall do good beyond the hopes of the sanguine, or the wishes of the benevolent; but if only so fast as to prevent the disproportion from getting greater, we shall intercept an incalculable mass of misery. Every class of society is interested in this question. The farmer in the first instance, then the laborer, who would find more employment, in proportion as the farmer had more profit of his labor,—the manufacturer would have cheaper food and more cus-

tomers,—the exporter would enlarge his commerce, and require more ships; but the chief, the greatest, the most lasting benefit would accrue to the land-owner. Instead of ten acres with poor rates, he would have, as it were, fifteen without. The country gentlemen are those on whom it is most incumbent to put this scheme into execution; and it could appeal to no fitter patrons. There never was a time in which there existed among them so much intelligence and public spirit as at this day; but hitherto those qualities have wanted direction and concert.

It has already been hinted, that the instruction here proposed could be given only at schools. Grown men scarcely ever have resolution enough to carry them through the fatigue of studying fresh sciences. Either distinct schools might be established, or the existing schools might be modified. An intelligent farmer, who is already in the habit of taking pupils, might be provided with a scientific tutor. In the morning, the boys might employ themselves, as they do now, in personally observing and assisting in the affairs of the farm; and in the evening they would receive from their tutor instruction in chemistry, botany, the structure and diseases of cattle, the knowledge of insects and of the weather, natural philosophy and book-keeping. I suppose a couple of years well employed would be sufficient to give a young man a competent knowledge of these matters. A difficulty might present itself in the first instance, in finding tutors properly qualified; but that would be at the beginning only, for the pupils of this year would be the tutors of the next, and so a perpetual succession would be provided. People are shy of new things; but a father in choosing a school for his son would naturally say, (if the charge was not increased,) whether these things be of any use or not, we shall get them for nothing; the boys will receive the usual instruction and this besides, be it worth little or much; and, therefore, by all means let us have it.

The only means by which there is any hope of accomplishing these purposes is, the formation of a comprehensive Agricultural Society; and it is a little surprising, that amongst the innumerable societies now existing in London, there is none specially dedicated to the improvement of agriculture. There are many provincial farming societies, probably all useful more or less; but there are important purposes which they are not qualified to effect. Therefore, I propose the formation of a central society, to be established in London, for the improvement of the agriculture of the kingdom, which might be called the "British Society of Agriculture," with the following objects:—

To provide a suitable building, or rooms, for holding a library, museum, &c.

To hold meetings once a fortnight, at certain seasons of the year.

To procure from the most eminent scientific men of the day, lectures on the application of the various sciences to agriculture, which might afterwards be printed.

To correspond with foreign societies, and to form a centre of communication for those established in this country.

To take in all the periodical and other scientific works applicable to agriculture, published in any part of the world, and to print and circulate, in a cheap form, monthly digests of whatever useful matter they might contain.

But, principally, to establish throughout the kingdom schools for the instruction of farmers' sons in the elements of the Physical Sciences.

IMPROVED SYSTEM OF BEE MANAGEMENT.

From the Penny Magazine.

There is no branch of rural economy connected with more agreeable associations than that of bee management. The proverbially industrious habits of the insect, and its extreme ingenuity in the construction of its domicil, and the deposition of its treasures, are such as to excite the admiration of the most unobservant. The common necessity of destroying the stock, in order to obtain the produce of their labors, has been always matter of regret. Many plans have been hitherto devised for the purpose of obtaining the honey without the destruction of the bees, but they have only been attended with partial success. The object has, however, been latterly and more perfectly attained by Mr. Nutt. a practical apiarian of Lincolnshire, whose system of management has given this branch of rural economy an inportance and value of which it was not before considered susceptible, both in the greater productiveness of the bees, and the much superior quality of the honey.

The first part of Mr. Nutt's plan of operation is to leave the hive, into which the stock is introduced, untouched. When it is filled with honey (the contents of which are to be reserved for the use of the bees,) the capacity of the hive is increased, by the addition of another box to the side, communicating with the hive by apertures, which give free admission to the bees in all parts of the box.

The next important object in Mr. Nutt's system is to ensure a regulated and uniform temperature in this portion of the hive, without diminishing the temperature of that which contains the stock. The ventilation necessary for this purpose is effected by the means of a perforated tin tube, extending down to a considerable distance from the top into the hive, and connected with an aperture at the bottom, which may be partly or wholly closed by a tin slide, thus modifying the circulation of the air and consequent degree of temperature. The temperature of this side box, which is indicated by a thermometer introduced into the tube, ought to be 70°, which is the natural temperature of the working hive; but, in that which contains the stock, a temperature of 90° is necessary, as well for the incubation of the queen bee, as the maturity of the young. The parent hive is, then, as well the residence of the queen bee as the nursery of the young, whilst the side boxes are but additional storehouses for the reception of the superfluous honey, which may be taken away without impoverishing the stock, or robbing them of their winter sustenance.

When the thermometer placed in the side box rapidly rises to 90° or 100°, the necessity of again providing the bees with fresh room is indicated; and this is effected by establishing another box on the opposite side of the hive. The bees, finding an increase of room, will readily recommence their labors in this new apartment.

Then follows, in Mr. Nutt's system, the operation of separating the bees from this second hive.

This is effected by the ventilator, by which the internal temperature of the hive may be reduced to that of the external atmosphere; and when, on the approach of night, the bees, recoiling from the cool air, go back into the middle box, the connexion between the two may be closed, and the full hive withdrawn, without the imprisonment or destruction of a single laborer. The same arrangements are to be again renewed, as the bees continue their successful labors. In this system no provision is made for swarming, which cannot occur under this arrangement, the emigration of a part of the stock being only occasioned by a want of room in which the bees may pursue their labors.

The honey furnished under this system of management is found to be far superior both in quality and quantity to that obtained under any other arrangement. The honey and wax are as white as refined rugar. This superiority in quality it owes as well to the modified temperature at which the bees secrete their products, as to its total exemption from all extraneous animal and vegetable matters, and, in particular, from the pollen or bee-bread, which is taken in considerable quantities into the stock-hive for the support of the young. This superiority of the honey is only equalled by the quantity of the supply: the usual annual supply from one stock is about one hundred-weight of honey; whilst, in the course of one season, Mr. Nutt has procured the large quantity of 296 lbs. This increase in quantity is owing to the excellent disposition of the arrangements, by which the industrious efforts of the bees are never retarded, nor their strength weakened at the time when the fruits and flowers most abound from which their treasures are obtained.

AMHERST AGRICULTURAL SOCIETY.

For the Farmers' Register.

At a regular quarterly meeting of the Agricultural Society of Amherst County, Va. held at the court house of the said county, on Monday the 4th day of August, 1834.

A quorum for business appearing, but the President not being present, John J. Ambler, the first Vice President, took the Chair, and called the Society to order.

In consequence of the recent organization of the Society, the several Vice Presidents were excused for not making reports to this meeting of the state of agriculture and the growing crops in their respective hundreds, and John J. Ambler, the 1st Vice President, in lieu of such report, presented and asked the attention of the Society to a report of the committee of the Agricultural Society of Albemarle, on Farms, made to the Society at their Show and Fair the 1st October 1828, and on motion, Resolved, that the Secretary do procure to be printed for the use of the Society two hundred copies of the said report.

On motion, ordered that the Secretary procure a copy of Ruffin's Farmers' Register, commencing with the beginning of the work, and continuing with its publication in future, and that he cause the same to be bound in volumes, to be kept by him for the use of the Society.

The Society proceeded to fix the subjects and premiums to be awarded at their next meeting the first Monday in November next, whereupon it was agreed that the premiums following be offerd to the members who shall be the actual owners of the animals, the producers or manufacturers of the other articles, that is to say—

1. For the best thorough bred Stallion, over four years of age, - - $10
2. For the best thorough bred brood Mare, over four years of age, - - 10
3. For the best Stallion, other than thorough bred over four years of age, - - 5
4. For the best brood Mare, other than thorough bred over four years old, - 5
5. For the best thorough bred Colt, under two years old, - - - 5
6. For the best thorough bred Filly, under two years old, - - - 5
7. For the best Colt, other than thorough bred over two years old, - - 5
8. For the best Filly, other than thorough bred under two years old, - - 5
9. For the best Jack Ass, over four years old, 10
10. For the best Jinney, over two years old, 10
11. For the best Mule, over two years old, 5
12. For the best full blooded improved Durham short horned Bull, over three years old, - - - - - 10
13. For the best full blooded improved Durham short horned Cow, over three years old, - - - - - 5
14. For the best full blooded improved Durham short horned Bull, under two years old, - - - - - 5
15. For the best full blooded improved Durham short horned Cow, under two years old, - - - - - 5
16. For the best half blooded improved Durham short horned Bull, under two years old, - - - - - 5
17. For the best half blooded improved Durham short horned Cow, under two years old, - - - - - 5
18. For the best Bull, of any other breed over three years old, - - - 3
19. For the best Bull, of any other breed, two years old or under two years old, - 3
20. For the best milch Cow, of any other breed over three years old, - - 3
21. For the best Cow, of any other breed two years or under two years old, - - 3
22. For the best grass fed Bullock, - - 10
23. For the best yoke of work Oxen, - 10
24. For the best Ram, of any breed, - 2
25. For the best Ewe, of any breed, - 2
26. For the best thorough bred Boar, of the Barnitz breed over two years old, - 5
27. For the best thorough bred Boar, of the Mackey breed over two years old, - 5
28. For the best thorough bred Sow, of the Barnitz breed over two years old, - 5
29. For the best do do of the Mackey breed do do, - - - - - 5
30. For the best Boar, of any other breed over two years old, - - - 5
31. For the best Sow, of any other breed over two years old, - - - 3
32. For the best Shoat, of any breed six months or under six months old, - 3
33. For the heaviest fatted Hog, of any breed 5
34. For the best two horse power hill-side plough, - - - - - 2
35. For the best three horse power plough, - 2
36. For the best acre of ploughing to be

done before the Society at Amherst Court House, with a plough drawn by not less than two horses or one yoke of oxen, on the first day of the November meeting next, - - $20

37. For the best piece of five yards or over five yards of negro clothing of household manufacture, fabricated of wool and cotton, - - - - 2.50

38. For the best piece of five yards or over five yards of negro clothing of household manufacture fabricated of cotton 2

38. For the best piece of five yards or over of Jeans, fabricated in like manner of wool and cotton, - - - 2.50

39. For the best piece of five yards or over of cotton Counterpane of like manufacture, - - - - 2

40. For the best piece of five yards or over of cotton and wool Counterpane, of like manufacture, - - - 2.50

41. For the best piece of five yards or over of domestic Carpeting, of like manufacture, - - - - 2.50

42. For the best specimen of any other household manufacture, wholly of cotton, wool or silk, or of any of them, 5

It is hereby declared by the Society that whenever the term thorough bred is used in their specifications, it shall be construed to mean that the animal has at least eight pure crosses of the particular breed.

The Society next proceeded to fix other subjects for premiums for the next year, the premiums and the regulations under which they shall be awarded, to be hereafter regulated, of which due notice will be given, that is to say:

1. For the best cultivated farm, not less than ———acres the property of a member.
2. For the second best do do do acres the same.
3. For the third best do do do acres the same.
4. To the overseer (if any) of the above farms over and above the premiums which may be awarded to the owner or employer.
5. For the greatest products of four contiguous acres of high land in wheat.
6. For the greatest products of four contiguous acres of high land in corn.
7. For the greatest product of four contiguous acres of high land in clover hay, the hay to be weighed at least one month after being cut, and the land to be measured in every instance by the chain, under regulations hereafter to be ordered by the board of agriculture.
8. For the greatest product of one acre of high or low land in timothy or other grass hay, to be weighed and measured as in the 7th specification.
9. To the grower of the hogshead of tobacco, which shall be sold for the highest price in open market for cash to the highest bidder in the town of Lynchburg.
10. For the overseer (if any) who shall superintend the cultivation and prizing of the same, over and above the premium to the owner.

Ordered that the contributions for membership for the present year be paid to the treasurer on or before the 3d Monday of the present month.

On motion, *Resolved*, that the Editors of the Lynchburg Virginian and of the Farmers' Register be requested to publish these proceedings in their respective papers.

The Society then adjourned till the first Monday in November next.

JOHN J. AMBLER, President, pro tem.

Robert Tinsley, Secretary.

COLIC IN HORSES.

For the Farmers' Register.

It is a source of consolation to sensitive minds to reflect that the diseases of the brute creation are few and simple in their nature: but at the same time it is mortifying to know they are not considered sufficiently important to require the attention of men of science and ability. Too little attention is generally devoted to a proper acquaintance with these diseases, when their treatment properly belongs to every husbandman. If each farmer having a knowledge of an approved remedy for any disease were to communicate it, the information would become as extensive as the Register is circulated—nor would I consider it too heavy a tax upon its columns. These truths being impressed upon my mind, I am disposed to follow the humble manner of some of your correspondents, and give a recipe I have always found singularly efficacious for colic in horses.

The causes of this disease are numerous—bad food, hard rides, constipated bowels, sudden transitions from heat to cold and the reverse, bots, and even customary food when the system is previously weakened by fatigue and overaction. To cure the disease produced from any of the foregoing causes I generally administer an ounce of laudanum in a little water, which has invariably succeeded with me—but candor compels me to acknowledge my veterinary practice is not extensive: but I have used the above recipe successfully after the ineffectual administration of a variety of other remedies, which entitles it to farther trial.

Its mode of operation may be explained upon philosophical principles. The various causes of the disease generally destroy the equilibrium of circulation and excitability. The blood flows from the surface of the body towards the point of diseased or weakened action, and congestion ensues in some part of the alimentary canal. So long as this congestion exists, so long must nervous irritation and spasmodic action, and consequently the suffering of the animal continue. But restore this altered circulation and derangement, and ease follows; a healthy and natural condition of the system immediately supervenes. Now no remedy promises so far to fulfil these healthy indications as laudanum. It is a powerful anti-irritant and diffusible stimulant, as well as anti-spasmodic. The irritation being relieved by any remedy, the spasm relaxed, and a cure follows as surely as light drives away darkness. No danger need be apprehended from its early administration, but if fever and inflammation were to exist it would be certainly forbidden. This condition of the system requires bleeding, purging, and clystering—and frequently a use of cold water on the surface.

R. H.

Prince George.

For the Farmers' Register.

REVIEW.

An address to the Essex (Mass.) Agricultural Society delivered at their annual cattle show, September 26th, 1833: By Jeremiah Spofford. Published by order of the society. Salem, printed by Foote & Chisholm, 1834.

With the mechanical costume of this publication, as also with many things in it we have been much pleased. The address itself was delivered by a gentleman of one of the learned professions before the farmers of his county. This is as it ought to be. No professional gentleman *descends* to encourage agriculture by speech or example. It is also pleasant to see any gentleman speaking well of his native land, and expressing, even in strong terms, as our author does, his love of country. Nor are we less pleased at any well directed intelligent efforts to improve the solid wealth of any community, even if it were in China, much more when in our own beloved country. Let all men by all fair means endeavor to generate general contentment in the minds of their industrious neighbors. We are much pleased with some other things in Dr. Spofford's address. We think he has paid a just and becoming tribute to christianity and its institutions, and has also done honor to his own head and heart, when he says, that his

"memory still loves to 'hover o'er' those inestimable Sabbaths, when, after six days labor done, we found a day of rest, and assembled within these very walls, to enjoy it in social, solemn worship; nor can any one know the value of those Sabbaths, unless it be those who spend the week in patient labor, and assemble on the seventh as a sacred holiday, to greet the countenances of their friends, and pay their devotions to the most high God. Here then we met few except cultivators of the soil, prepared by their labors in the field to render their tribute of gratitude to Him who gives rain from heaven, and fruitful seasons, filling their hearts with food and gladness. Venerable fathers! who then bowed in this sacred temple! may your sons as patiently cultivate the soil you then possessed, and as devoutly worship here. You will forgive this digression, when you look around the world, and see how closely connected are christian morality and agricultural prosperity,—and you will as soon expect to gather grapes from thorns, or figs from thistles, as to find a well cultivated farm under the superintendence of him who neither fears God, nor regards man."—pp. 5, 6.

Nor are we less gratified with the sensible remarks on the importance of a total disuse of ardent spirits among all persons engaged in agriculture. On this subject there ought to be, and we are persuaded when the facts are well examined and weighed, that there will be but *one* judgement. The following sentences are very appropriate:—

"No portion of the community have paid a heavier tribute to the distillery than the farmers. Their laborious occupations and exposure to heat and cold, fostered the belief that ardent spirits were necessary to them. But this error is now nearly exploded, and I rejoice that the hour of their emancipation has arrived. Too long have you submitted to a tax ten times more burdensome than Great Britain ever attempted to impose, when it was resisted by a seven years' war. But what is worst of all is, that this tax is not like the tax on tea, merely collected and carried out of the country, but it returns in another form to curse the payer and make him an idiot and a slave. Here some will object, and say they still use spirits, and have neither spent their property, nor destroyed their intellects. I allow the truth of the assertion, some can bear the expense without serious embarrassment, and regulate their appetites so they are never drunken. But to such I would say, you incur a useless expense, and encourage by your example your neighbor, who can neither bear the expense, nor regulate his appetite. Let me entreat such to change their example to the other side of the question, and lend their aid in drying those tears of heart-rending anguish which flow without mixture, where a husband and a father is spending his estate, wasting his time, and converting himself into an idiot, or a savage. We have all seen those that thought the same—that they knew what did them good, and could govern themselves; that they were in no danger of being drunkards, and resented even the suspicion of danger. But still they are lost, their business neglected, their property spent, their farms mortgaged, their families ruined! I would that this were only imagination; but I know, and you all know, that it is the truth, and that in numerous instances. But some say this is a land of liberty, and they scorn to be *persuaded* not to exercise it, in every particular. What a glorious liberty it is for a man to exercise, to leave his business, travel four miles and back, under a burning sun, to vindicate his right to spend twenty cents for rum! to tickle his palate, intoxicate his brain, and burn up his liver—hiding his bottle, and hanging his head like a thief, when he meets those whom he owes and cannot pay. My friends, I paint from real life, but I hope such farmers are scarce. But some farmers yet say they cannot hire laborers, unless they give them ardent spirits. This does for an excuse, when both the owner and the laborer are desirous to use it; but no man who is firm and unwavering, leaves his crops ungathered for want of help; but hundreds of farmers are now ready to testify that they never had their work done when spirits were used, so easy and so well. Seventy physicians of Boston have fixed their names to the opinion, that ardent spirits are *never* necessary to persons in health: and my own experience in labor and exposure in cold and heat, by night and by day, confirms me in the opinion, that a dose of spirit is no more necessary in health, than a dose of calomel or tartar emetic.—pp. 20, 22.

Nor are we less pleased with our author's remarks on personal industry. We have always concurred in such doctrine as is taught in the following paragraphs. In the South and West, as well as in the North, it is true that—

"the person who should in this age and nation, wear appendages or ornaments, to show that he did nothing, would at the same time, in the estimation of an immense majority, be making himself ridiculous, and showing himself worth nothing."—p. 7.

So also our author properly says—

"It is often literally true that the hand of 'the diligent maketh rich;' but where from any cause it fails to enable a person to gather *heaps of shining dust*, it always in this land enables the diligent to possess constantly and plentifully the necessaries and comforts of life, which to every reasonable mind is true riches."—p. 16.

We are also much gratified to see proper encomiums passed on agricultural pursuits. It must be the case, that for at least a century to come, if not always, notwithstanding many and powerful inducements to the contrary, the great body of the solid wealth and influence in this land, must be in the hands of the agriculturist. This is the safest place for it, and we rejoice to see just commendations bestowed upon this class of our fellow-citizens. We too can sympathise with our author, when speaking of farmers he says—

"It was among them, and in their employment, that I spent those years of happy childhood, when every thing makes its deepest impressions. My earliest ideas

of property, were derived from their possessions. To me houses and farms and cattle were wealth, and their owners nature's nobility. While money and notes and stocks and merchandise, appeared fleeting and transient—there seemed something in the possession of *solid acres*, especially when these were *compact farms*, with their venerable mansions, descending from generation to generation, that elevated the possessor, and gave a dignity and character to his pursuits truly honorable and desirable. Nor have these been merely the illusions of youth: they have followed me, and I have cherished them in my riper years. And I view with gratitude that kind Providence, which cast my youth among that class of society. The labors of the field gave a value to my scanty library, and my few hours of study, of which, under almost any other circumstances, I could have had no conception."—p. 5. "Agriculture at the present day, instead of being a mean, servile employment, is now justly ranked as an important science; and the studies of the learned are now often directed to the most laudable employment of multiplying the fruits of the earth, and improving the quality of the fruits produced."—p. 8.

We are not so clear in deciding on the character of *all* our author's representations, as on the foregoing. He states some things, concerning which we confess ourselves skeptics. We not only doubt the truth but also the morality, if true, of such a sentence as the following:—

"I would by no means encourage ambition, but still a desire for property, and accommodation (call it by what name you please) is the life-spring of all that is valuable in society."—p. 18.

Nor do we feel altogether so clear as to the utility of agricultural festivals, popularly called "cattle shows." We have been on the northern side of Mason's and Dixon's line more than once, and we have been by our friends carried to the cattle show, and we confess that a good "address" notwithstanding, we did doubt whether more was not lost than gained to the community. Nor are we sure that the perpetuation in any county, of the observance of the "farmer's holiday," would not be a great evil. Not that the design is not good: but invariably, so far as we have seen, the original design is well-nigh lost sight of. Could the original design be kept fairly in view, our judgement might be different. The following sentiment is at least a curious one, containing as it does, what we have never before seen asserted:—

"Larger crops than are here obtained, wherever the the hand of the diligent applies the plough and manure with liberality, if attainable, are hardly desirable."—p. 9.

It seems rather strange too for any one to plead against a "rich alluvial soil" in these words:—

"The immense vegetation which annually decays in a rich alluvial soil, saturated with water, is sure in a warm or new country, to render the air unhealthy, and produce bilious and other diseases."—p. 12.

If such reasoning be good, it proves the desert and the "barren sands" better than fertile valleys. Nor will the history of the new countries in the United States justify such remarks as the following:—

"Nor have many of these emigrants considered what they will find painfully true, that they and their generation will have passed off the stage, before their new homes possess the advantages of a New England settlement,—comfortable dwellings, fruitful orchards, good roads, social villages, schools of science and temples of the living God.—p. 13.

We were in the great city of Cincinnati about a generation ago, and it was then about as remarkable for its want of comforts and houses and churches and schools, as it is now, and for years has been, for its possession of them. A larger proportion of the youth of Ohio are acquiring liberal educations, than of those in Massachusetts. Let the doctor re-examine his statistics. Nor could we deem it so terrible a calamity, for the new countries never to be modeled in morals and religion after New England, provided they do better, as easily they might. We see very much to deplore in both these respects in New England. The Macedonian cry of which our author speaks, shows a readiness to be assisted, even in morals and religion, and by New England too. Has it never entered the doctor's mind, that it might be charity to go and abide in the wilderness for the purpose of making the "solitary place glad?" We do further and seriously doubt whether the title of "cradle of liberty" can be properly applied to New England, in the manner of our author. There is no history to justify such a remark. We had supposed, and we still suppose, that liberty was rocked not a little, far south of the land of constant industry and steady habits—the land of "bibles and of Sabbaths"—the land of "red school houses and white churches." Edmund Burke was of the same opinion.

We have mentioned some things in this address, concerning which we had doubts; but we are pained to say, that we find in this publication some sentences, yea paragraphs, which we can but condemn in terms positive and unequivocal. Some of the things relate to the West and South West, and some to the South. As to the West and South West we shall not say much, except merely to give a specimen of the writer's views about that country. We do not remember to have read any thing more fanciful and inconsistent with geological facts, than the following paragraph in reference to the original conformation of the Great West:—

"Casting our eyes to the South West, the country along the lower Mississippi must have been once an immense bay, or arm of the Gulf of Mexico, but the alluvial deposite, floated annually down this immense river, from the boundless west, has filled up this bay: and made most of it into swamp, and part of it into something like dry land. The immensity of waters from three thousand miles and ten thousand hills, still keep a main channel through this wilderness of *water* and *mire* and *driftwood*, and depositing more soil, when the thickened waters first spread from the main channel, than was carried farther back, the banks of the river became much higher than the back country.—p. 11.

The paragraph respecting Mr. Flint is dishonorable both to the writer and Mr. Flint.—

"A clergyman of this state, who was seized with this spirit of emigration, some years ago, and has indulged it to his heart's content, informs us that the villages on the Arkansas and Red Rivers are uninhabitable during summer, and the people leave them and build camps in the woods, and on higher grounds, to escape certain death. He spent one summer in one of these encampments, battling with the musquitoes, and resolving to improve the first moment of escape to a more northern climate."

Mr. Flint did something else in the West besides "battling with the musquitoes." How utterly destitute of truth is all that is said about the sirocco.—

"Who to avoid the drifting snow and driving sleet, would leave the land of pleasant sleigh-rides, and happy winter evenings, to breath the sirocco, which sweeps from the Gulf of Mexico for weeks together, up the boundless valley, loaded with the fetid exhalations of a thousand bayous and swamps?"—p. 14.

These are mere specimens of the justice done by our author to the great West. We would remark that we have travelled some tens of thousands of miles in the West, and have not seen any "signs" of what he speaks of; and that during twenty years residence and travel in the West, we never saw a family towards whom even charity needed to feel any compassion on account of want of shelter, or fuel, or substantial clothing, or wholesome food. Can the doctor say *more* of Essex County? But the West can defend itself. We feel ourselves called upon, however, to notice more particularly some statements respecting the South. The doctor seems more anxious to say hard things of the South, little as the tide of emigration from New England is towards it, than of the West. We regret that he did so; but we have the privilege of reply. How could the doctor feel justified in the use of such language as the following?—

"Upon better information, I found that instead of raising fine cattle without labor, they could scarcely raise them at all; that their beef was poor, and a Georgia cow scarcely yielded more milk than a New England goat; and that instead of green pastures all the year, grass hardly grows, and they scarcely know what a green pasture is."—p. 10.

Did the doctor know that the finest beeves in the United States were grazed on the South Branch of Potomac, and that no country produced more fine cattle than the mountainous districts of Virginia, and the upper part of Georgia? Does not the doctor wish he had not written such words? Every Southron knows such statements to be very different from his own knowledge. His remarks in regard to the health of the South are not any more fair, though more specious and plausible. Hear our author:—

"Along our southern coast, Virginia, the Carolinas and Georgia, present for the most part, for eighty or one hundred miles from the sea, pine barrens, sandy plains and swamps, abounding in noxious insects, and venomous reptiles. A single swamp lying in Georgia and Florida, is one hundred and eighty miles in circumference; and no degree of fertility, or an everlasting summer, could compensate for the pestiferous exhalations, which during many months of the year load every breeze with pestilence and death. Another medical friend, who spent a summer in Charleston, South Carolina, informs me that though the city is extremely unhealthy, compared with northern cities, yet the country around it, is vastly more so. Very few white people live in, and as few as possible attempt to cross over the level country for sixty or seventy miles back of Charleston in summer. To go beyond the ramparts of the city, especially in the night time, is for many months almost certain death! Now what degree of fertility added to our soil, would compensate for such an atmosphere?"—p. 11.

The noxious insects referred to are, we suppose, some more musquitoes, and the venemous reptiles must be, we suppose, snakes. We have long resided in the South, and although we have never been to London, yet we have been to Boston and to Charleston too. We have also travelled by day and by night, over swamps and rivers and through "pine" woods, (there are no "pine barrens") yet did we never tread upon, nor were we ever in danger of being bitten by one of the venemous reptiles. But a large swamp is so terrible to our author! Especially one in Georgia, "one hundred and eighty miles in circumference!" seems to be very alarming. Does our author know that swamps in the South contain not stagnant but running water? If not he ought to learn. Does he know that people of great age are found living all around them? No portion of the United States can surpass the South in furnishing instances of great longevity. That there are diseases prevalent in our climate, to which the New England states are very much strangers is certain; but then we generally know how to manage them. One physician in a low county near the Great Dismal Swamp, (be not startled at the name) had in his practice in one year eighty cases of bilious fever, yet did he not lose one patient. Has it never occurred to the doctor that "the land of pleasant sleigh-rides" was also a land of pining consumptions, inflammatory rheumatisms, unmanageable pleurisies, &c.? We know but little of such things in the South. It ought not to be forgotten too, that during the prevalence of diseases peculiar to the South, many of our people travel even to Essex County, and go to Boston too, and when they come home and make speeches before Agricultural Societies, they are careful not to tell scare-crow tales about New England. And did not consumptions, &c., drive our Northern brethren to the South sometimes, we fear that such speeches as the one under review would leave us hardly any friends in New England.

On page 17 of this address is a most unworthy insinuation, viz: that it is a common thing for slave holders to spend their time "at horse races or barbacues." Were this true, we are yet to learn that a "sleigh-ride" is less cruel than a "horse race," or that the manners and morals prevalent in "sleigh-rides," exceed in elegance or purity those of a barbacue. We confess ourselves as much opposed to all frolics as the good people of Essex County can possibly be. But we do consider it unworthy of any professional gentleman to be so ignorant of Southern manners and habits, as to suppose we have in use no modes of employing our leisure time besides those already alluded to, and in addition telling stories in long "happy winter evenings." If we had learned the language of Downingville, we would say that our "dander was raised" when we read the following:—

"Over all the Southern country you might search in vain for an assembly like this. An industrious yeomanry is there unknown."

We confess that we felt emotions of a just indignation when we read those words. We felt as our author would feel if we were to assert the same things respecting Essex County. And yet we could assert it with as much truth as has our author. It is painful to us to notice such looseness and boldness of assertion. Our author's views of slavery are as different from what we suppose to be correct. Hear him:—

"There the taskmaster brandishes his lash, and the slaves labor beneath a burning sun, curse the race that fatten and luxuriate upon their toil, and whet the appetite of revenge and the scythe of death for a day of future retribution. Fathers and mothers of New

England! Could all the gold of Mexico induce you to fix your domicil, and leave your children where their only chance of safety was the prospect of holding a population of two and a half millions, and their rapidly increasing posterity in a state of perpetual bondage? with an equal chance that thirty years will turn the scale, deluge the country in blood, and give the white population only the desperate alternatives of death, slavery, or exile?"—p. 12. "While our Southern brethren may threaten or nullify—change the tariff or perpetrate a revolution,—they will still find they have not reached the cause of their depression. The absence of voluntary vigorous industry, is the real cause of the evils of which they complain. A white population ashamed to be 'seen with implements of labor in their hands,' and a black population doing as little labor as possible, is enough to 'nullify' the prosperity of any country. Perhaps some may imagine that it were easy to grow rich where men possess slaves who labor without wages. But let such remember that these slaves are also men, who must eat or they cannot work—that they must be maintained, the old and the young—the sick, the 'lame and the lazy,' with the taskmasters necessary to make them labor at all, before any surplus can arise to support the luxury of the landlord."—p. 17.

The truth of so much of the foregoing quotations as relate to the unproductiveness of slave property and slave labor is most readily admitted. We have long been of opinion, that ten thousand dollars vested in land and negroes will yield less than the same vested in any stocks in our market, nay that very frequently it is a losing business. Of this Southrons are generally aware. They feel the pressure heavily. And were this the time and place, we think we could show how and why it is so. Nor are we ever going to undertake a defence of the *principle of slavery* which ought never to gain admission into any country or government. We believe that whoever founds a State in wisdom excludes slavery. We believe that no evil presses on our Southern country with equal force and that "he ought to have the King's daughter in marriage," who will devise any just and practicable method of removing it, without introducing greater evils both to black and white. But against such statements as those just quoted we must lift up our voice. One impression intended to be made by these statements is, that there is cruelty in the amount of labor required of slaves in the South. In the vast factories of the South, hands earn from fifty cents to two dollars per week by doing work beyond the tasks required of them. On Southern plantations where labor is performed by tasks, the tasks are generally performed by 2 or 3 o'clock, P. M. Another thing in the paragraphs quoted is offensive to us. It is the apparent pleasure the writer seems to take in telling how dark the prospects before the Southrons are. The fact that probably in thirty years the South will be deluged in blood calls from him no regret, not even a note of exclamation or a prayer to the throne above. But like certain preachers who say much about the wrath to come, he seems to have real pleasure in his denunciations. Another impression evidently intended to be left on the reader's mind is, that slaves generally in the South are under the "care of some hireling taskmaster," and that the usual method of getting along is by "brandishing the lash." Our author ought to know that generally slaves are now spoken of and regarded as a part of a man's family, and that in sickness the master or mistress are the assiduous nurses, watching day and night; and that not one in fifty of Southern slaves is committed to a steward without the liberty of appeal and complaint and reference to the proprietor. As our author does not seem to know much about modes and manners in the slave holding States, we would like to read him a short lecture on the subject; but we hope what we have said will lead him to more careful and extensive inquiry. It is not many years since two men in New England killed their wives. What would Dr. Spofford think, should one of the Southern papers assert that the New Englanders were murderers of their own wives? The general impression made on our minds when our author describes the South, is very much such as would be made on his mind, were we, who never saw him, to send him his own likeness drawn by ourselves. The serious objections we have to such representations as those referred to are—

First. That they are calculated to keep those to whom they were made, with views as narrow, and feelings as illiberal, as they had before they read or heard the address; whereas *no educated* man is excusable for not warring against prejudices and illiberal views in himself or others.

Second. They show a want of sacred regard and tender interest for the perpetuity of our National Union. Such is the spirit of most of the contents of page 17. And he who shall help to sever this union, formed as it was, upon the full recognition of slavery, as a matter not to be touched by any but slave holders, will be spoiling the best pattern of a free government that has ever been given to the world.

Third. All such representations betray an amount of ignorance that we cannot pass by without reproving. We are fully of the opinion of the author when he says—

"True these opinions would be of more weight if they came from abroad, or from one who had travelled extensively."—p. 16.

Why will not the doctor travel? We ought in all frankness to say to him, however, that we do not suppose it would be safe for him to travel in the South, except in disguise. Such statements as are in his address would be very apt to be noticed could their author be seen. The Southern people are of one mind in intending to let no man interfere with their domestic relations. Men can say what they please on the north side of the Potomac, but having said *such* things there, it would hardly be safe to travel in the South. The reason is, we know who are apt to scatter "arrows, fire brands and death."

Fourth. We also agree with our author when he says:—

"I should consider [ought to consider] myself as criminal, were I to traduce the character of a country, as the character of an individual."

Oh doctor! you have traduced the characters of some millions of your countrymen. Recant—repent—reform!

We have not much to add. We wish to state however, for the doctor's information, that we have some good things in the South. It is true we are rather scarce of "venemous reptiles," but in the "far South" we have very fine alligators which are equally valuable. We have also some very fine swamps, which furnish immense quantities of timber, found profitable to us and valuable

to our northern friends. We have also very fine pines, which soon restore exhausted lands, and the wood from which bears exportation to northern glass works. We have also some literature in the South. We have the Spectator, the Rambler, Dr. Spofford's Address at the Cattle Show, and frequently a newspaper from Boston, and so on. We have also, especially in Virginia, some very fine tobacco, which always sells well at home and in France. We have also no small quantity of "lugs," which when twisted into "plug" and "pig tail," sells very well in New England. We also grow very good gouber peas and sweet potatoes, yams, &c. We also find our raw cotton from the highest "upland" to the "sea-island" in good demand, not only in Liverpool, but also in New York and Providence. Our cotton cloths and yarns also do not suffer in comparison with any in the world. We can also let our northern ship builders have a good supply of tar, pitch, turpentine, plank and timber. Indeed we value ourselves not a little upon our "live-oak." There is also left among us some degree of patriotism, in so much as that none can disturb our domicils from abroad without suffering for it. We are also a very peaceable people. We have always had, and still have, our full share in the Federal Government. We have never complained that the South has not furnished her full quota of presidents, orators, and able statesmen. We have also along our southern coast neither "eighty nor a hundred miles from the sea," lands, which have been in cultivation for more than a century, and were never artificially manured, and yet yield as good crops as they did eighty years ago. We have also as good land as Essex County generally contains, within less than one hundred miles of the sea, and supplied with inexhaustible beds of calcareous manure, for sale at from $1 to $2 per acre. And last but not least, we are very glad to see amongst us all "*Northern gentlemen*," who do not "traduce" us before they leave home, and to show to them a degree of hospitality, which they shall be compelled to declare Essex County never surpassed.

Finally, we are much gratified that our author confesses that New England is not perfect. He says she has "the drifting snow and driving sleet," and that "the cold seasons of 1812 and 1816 and the intermediate years" were to some rather alarming; that the "lands are not enriched by the alluvion of rivers three thousand miles long," and that "the sceptre of political power has departed." We are sorry that any such evils should have come on New England, a land which our fathers taught us never to "traduce," but always to give her "an honorable place in her country's annals." But as they have come upon her, we are pleased that our author has ingenuousness sufficient to make the confession.

ON BUCKWHEAT AND MILLET.

To the Editor of the Farmers' Register.

Rockingham, August 12th, 1834.

Should none of your correspondents more satisfactorily answer the inquiries of H, in the June No. of the Farmers' Register, on the subject of buckwheat and millet, the following remarks, the results of some experience on those subjects, are submitted, which, (if you think they can be of any use to H or any body else) are at your service.

On the subject of buckwheat he inquires, "whether it is as great an impoverisher of land as oats, and whether if turned in it becomes a good fertilizer? What soil is best adapted to its growth, and what quantity of seed is generally sown to the acre?" I think, and I believe it is generally so thought, in this neighborhood, where both are commonly raised, that buckwheat is a greater impoverisher than oats; its straw *either green or dry*, is of less value for manure, than the straw of any other kind of grain. Any soil in this section of the state produces it abundantly: a thin sandy soil, that will produce a good crop of no other kind of grain, will bear a tolerably good one of buckwheat. And although the quantity of straw will be much greater on a rich, there will be *less grain*, than on a thinner soil. On rich land, it rarely fills well, but on a suitable soil, and in a favorable season, the product is very great. The quantity of seed sown to the acre and the *time* of sowing should, I think, depend upon the object in view in sowing it. When the grain is the object, half a bushel, or three pecks is ample, as it throws out many lateral branches. When designed to be ploughed down as green manure, I would sow a bushel —sown early in the season it produces more straw —when later more grain,—indeed the later it is in ripening, so as to escape frost, (a slight frost will kill it) the greater will be the product of grain. For green manure I would sow in May or early in June, (two crops may be ploughed down in the same season:) if I wished to reap the grain, I would not sow till after the middle of July. I have sown it in August, and at the same time, sown rye and cloved seed, upon the same ground, and all three succeeded well.

Millet. On this subject H inquires whether "millet is made to any extent in any of the United States? What soil suits it—is it an exhauster, and what is the price per bushel?"

A species of millet, (very much resembling the fox-tail grass, only of a much finer, richer appearance) was raised to some extent, some few (parhaps 8 or 10) years ago in the Valley. None is raised hereabouts now. It requires a very rich soil, very neatly prepared. It is certainly a great exhauster. When in repute here, (it had but a short day) the price per bushel was about $2. It could not now be given away, to be sown here.

On a suitable soil, that is, one rich enough to produce a fine crop of hemp, it produces well both in hay and seed—the seed when ground, made a fine rich looking meal, and was excellent food for milch cows—the hay when well cured, is nearly equal to timothy. Its sponsors pronounced it "preferable to either clover, meadow, or timothy hay." But "*chacun a son gout*," seemed to think all my horses and cattle: they all preferred the clover.

In the memoirs of the Pennsylvania Agricultural Society, (1824) John Hare Powell says, "I have made many experiments, on various soils, and at different seasons to ascertain the product, as well as the properties of millet. Upon light land in good condition it succeeds best. It requires in all cases fine tilth and as much strength of soil, as is necessary to produce heavy oats. I have not seen either in Europe, or America, any green crop which so largely rewards accurate tillage, and

plentiful supplies of manure, as the species of millet usually grown in this and the adjacent counties. I have sown it from the 1st May to the 20th of June, and have invariably obtained more fodder than could have been had from any grass under similar circumstances. In the autumn, eighty bushels of caustic lime per acre were strewed upon an old sward, which was immediately ploughed, closely harrowed, sown with rye, and rolled. The rye was depastured in the winter and succeeding spring. Early in April the land was ploughed again; the lime and decomposed vegetable matter were thus returned to the surface. About three weeks after, it was harrowed to destroy weeds: early in May it was again harrowed for the same purpose: within a fortnight it was stirred with Beatson's scarifier to the depth of nine inches, harrowed, sown with millet and rolled. The crop was fairly estimated at three tons per acre." "On the 5th of May, five bushels of millet seed were sown on four acres: on the 5th of July the crop was hauled, and estimated at four tons per acre. I have obtained this season forty tons from sixteen acres, of which four only had been manured; the residue could not have borne a good crop of wheat."—pp. 198–9.

Wm. J. Miller, *Ib.* p. 201, says, "I sowed it (Egyptian millet) in drills on a loose sandy loam, on the 21st of May, too late by a month I should suppose. It grew rapidly, producing many stalks from one seed, and on the 24th of July it was three feet high and full of long blades. It continued growing rapidly and luxuriantly, and I fully expected to have obtained abundance of seed, as the heads appeared to be filling, and were from twelve to eighteen inches long, when on the 28th of September a severe frost checked it, and nipt it completely when in blossom. It was then from ten to twelve feet high, full of long leaves, and promising the largest crop of any description I ever saw."

John Elliott, *Ib.* p. 208, says, "I am of opinion that land in common condition, will produce twenty bushels per acre of good seeds, and two tons of hay."

From reading such highly commendatory accounts as the foregoing, many of us really imagined that this millet possessed almost as many excellencies as old Will Boniface ascribed to his ale. All however in this neighborhood who tried it, agreed that "it was'nt the thing it had been cracked up to be." As material for hay, compared with red clover, I should give a decided preference to the clover. If millet will yield a greater quantity, (which can only be the case on very rich land) the superior quality of the clover hay will more than compensate for any deficiency in quantity—and the one exhausts, while the other fertilizes the soil. Compared with timothy, (both exhausters) I should give to timothy the preference. The latter yields as much hay—is of better quality—affords a good fall pasture after the hay has been made, and will last for several years; while the millet has to be annually sown, and requires great labor and care to be bestowed on the preparation of the ground, and of the two is much the greater exhauster. But I may possibly depreciate millet (may be "I feel *an ambition* against it") because I failed with it. When it was first introduced into notice in the Valley, seeing its praises so eloquently set forth in several publications, and hearing too some very extravagant oral accounts of it, I procured ten bushels of the seed at the cost of twenty dollars, and with the trouble of sending some distance for it. Having no suitable lot for it, I had several acres in a field of rich river low ground, lately laid down in red clover, broken up, and carefully prepared. Here I sowed the millet, (about the middle of May:) it was somewhat slow in starting to grow, and the crab or crop grass sprung up with it, and materially injured it, and I doubt whether I had much more millet hay than I should have had of clover. Upon this rich alluvial soil, I had calculated upon an *immense crop*—judge then of my disappointment and mortification, when I found the millet struggling for mastery with crab grass, and when finally it did rise above that, and some of it attained the height of four or five feet, to be laughed at for my credulity, and told in ridicule that "it was nothing but a kind of big fox tail." My father who received those magnificent accounts of the productiveness and excellence of millet "cum grano salis," thought it wiser to experiment upon a smaller scale and confined his trial of it, to a single acre of very highly improved land that had been prepared for hemp. He succeeded much better than I did, although I do not think that his millet was half as high as his hemp in the same lot. However well millet may do elsewhere, I think that the disappointment in the central counties of the Valley was universal. Here where the climate and soil are so admirably adapted to the growth of clover, timothy, and green sward, there was no adequate inducement to bestow so much pains on the cultivation of a grass so much more precarious, and of such inferior value.

The object of his inquiries H states, is to ascertain what cheap grain is most suitable to sow on poor, light, sandy land in Lower Virginia. Assuredly then millet will not answer his purpose. Has rye ever been tried for that purpose in that section of the State? In the Valley it grows well on poor, sandy land, and I have known one gentleman who used it as a meliorating crop, and much to his satisfaction. His lands however were not poor. His practice was to sow rye early in the fall—depasture it in the winter and spring until about the middle of April: when the rye had attained the milk state, he turned his stock of hogs into it. The hogs soon became very fat, and he thought the additional quantity of pork thus obtained more than compensated for the whole trouble and expense of preparing the land and sowing the rye, while his land was much benefited by the straw. Enough of the rye would ripen and be shattered out, again to seed the land and a good crop, the second year be obtained. If the climate be favorable to the growth of rye, I should think it would be preferable as a meliorating crop to buckwheat, because rye is not near so great an impoverisher as buckwheat, and its straw is much more valuable as manure: and also where the land is in a tolerably good condition, the winter pasture which the young rye affords is of considerable value.

Would not an experiment of this kind probably succeed? A crop of buckwheat sown in the spring; ploughed down in the fall; the ground sown with rye; on that clover seed sown; and the sowing of the clover seed followed by the peg roller—the young buckwheat receive a dressing of plaster of

Paris, and also the rye at the time of sowing the clover seed (say in September.) The rye suffered to stand, ripen, and fall upon the ground would protect the young clover from the withering influence of the sun, and benefit the land very much by remaining upon its surface—perhaps as much, or more on such a soil, than it would do if ploughed under. Such an experiment upon a few acres would not require much trouble or expense. Many persons take it for granted, that their lands will not produce clover, or be benefited by plaster of Paris, without ever making any sufficient experiment to ascertain the fact. Some sprinkle a little clover seed carelessly and sparsely over a poor and nearly naked surface, without using any means to ensure its growth; and a failure is taken as conclusive evidence that their lands will not produce clover. The wonder would be, if under such circumstances it did grow. Light sandy land requires to be well compacted by a heavy roller, (or other means) to ensure the growth of clover seed. I became satisfied of this fact, by observing that wherever the soil was lightest and loosest, my clover seed always succeeded worst; and whenever a road had been made through that part of the field, by the wagons in hauling out the preceding crop, or a spot trodden hard by the stock of cattle, &c., there the young clover was invariably thickly set. I find that plaster of Paris has not only the effect of very greatly multiplying the product of clover on my light sandy land, but of very perceptively stiffening it. The year before the last, I measured two acres of wheat, growing upon an originally poor, light, loose, sandy soil, the natural growth on which was pine and hickory and oak saplings, with chinquepin and whortleberry thickly interspersed. This land has been in cultivation for ten or twelve years, in which time it has had its regular rotation of cultivation and rest, according to the five field system, (three crops of grain and two of clover in five years;) when in clover it has had at four different times a dressing of a bushel of plaster of Paris to the acre; never has had a particle of manure hauled upon it. The product of the two acres was over fifty-two and a half bushels of clean wheat. When first cleared, it was an easy draft for two horses to plough it eight or nine inches deep, and produced from twenty-five to thirty bushels of corn to the acre, and from ten to twelve of wheat. It is now a heavy draft for three strong horses with a McCormick plough to fallow to that depth. This increased stiffness of the soil, is doubtless attributable in part to other causes, than the action of plaster of Paris. The two acres measured were part of a field of between eighty and ninety acres, only a small portion of which was of the description of soil above stated. The average of that portion of the field in wheat (a part of which, seven or eight acres, had been manured with stable and barn yard manure) was within a fraction of thirty bushels to the acre; a part of the field was in rye—thirty-five acres in wheat produced 1030 bushels. Ten years ago on the same land, the average would not have exceeded twelve bushels to the acre. These thirty-five acres, being inferior to the residue of the field, I had a division fence run across it when last in clover, for the purpose of preventing this part from being too closely grazed—a good coat of clover was in August ploughed down, and the ground harrowed—the first of October it was cross ploughed; (my usual practice is not to cross plough or "stir the fallow" as it is called) on the 10th of October, one and a half bushels of wheat to the acre were sown, and carefully harrowed in.

S. H. L.

EXPERIMENTS ON THE FEEDING OF SWINE.

Extract from a communication to the Agricultural Society of Essex, (Mass.) from the Rev. Henry Coleman.

EXPERIMENT I.

Two hogs about one year old; one of them a barrow in very good condition; the other a barrow recently gelded, and in ordinary condition, were put up to be fed exclusively upon Indian hasty pudding or Indian meal boiled with water. We began feeding them the first of March 1831, and weighed them again on the nineteenth of the same month. In the 18 days they consumed six bushels of Indian meal. They were offered cold water to drink but did not incline to take any.

The result—

No. 1 weighed on 1st March	233 lbs.
do. do. 19th do.	269
gain	36
No. 2 (recently gelded) weighed on 1st March	190 lbs.
do. do. 19th	247
gain	57

The gain of the two was 93 lbs. in eighteen days. The quantity of meal consumed by them was 10 quarts per day to the two. This allows 30 quarts to a bushel deducting two for grinding. The price of corn at the time was 70 cts. per bushel. The expense of the increased weight is 4,5 cts. per lb.

March 21, 1831. Killed the hog mentioned first in the foregoing experiment. Live-weight 273 lbs. Weight when dressed 215 lbs. Loss in offal, loose fat included, 59 lbs. or a little more than one fifth.

EXPERIMENT II.

No. 2, mentioned above, weighed on 23d March,	253 lbs.
do. on 30th April,	312
In 38 days gain,	59 lbs.
No. 3. a shoat purchased from a drove, weighed on 28th March,	100 lbs.
do. do. on 30th April,	151 lbs.
gain in 33 days,	51 lbs.

This is a fraction over 1 lb. 8 oz. per day each, nearly 1 lb. 9 oz.

In this case their food was exclusively boiled potatoes mashed with Indian meal. Exact amount consumed not ascertained, but fed as freely as they would bear.

EXPERIMENT III.

The two last named hogs were for the next 20

days put upon Indian hasty pudding exclusively, with the following result:

No. 2 weighed on 30th April,		312 lbs.
do.	do. 20th May,	382 lbs.
	gain in 20 days,	70 lbs.
No. 3 weighed on 30th April,		151 lbs.
do.	do. 20th May,	185 lbs.
	gain in 20 days,	34 lbs.

The two in the above named 20 days, consumed four and one-half bushels of meal, cooked as above. Meal 78 cts. per bushel. Gain of the two, 104 lbs. in 20 days.

EXPERIMENT IV.

Sundry swine purchased from a drove, and fed with meal and potatoes, washed and mashed—

	28th March, 1831,		19th May, 1831,		
No. 1	weighed 97 lbs.	165,	gain in 52 days,	68	lbs.
2,	do. 134	182,	do.	48	
3,	do. 100	186,	do.	86	

The two following, raised on the farm, and fed as above—

	25th April, 1831,		19th May, 1831,		
No. 4	weighed 151 lbs.	206,	gain in 24 days,	55	lbs.
5	do. 140	165	do. do.	26	

EXPERIMENT V.

In this case it was not intended to force their thrift, but to keep the swine in an improving condition. They were shoats of the last autumn, and were of a good breed.

Tuesday, 3d April, 1833, put up four shoats, and began feeding them with Indian hasty pudding.

	3d April,	22d April,		25th June,	
No. 1,	176 lbs.	202 lbs.	gain 25	264 lbs.	gain 62
2,	119	153	" 34	226	" 73
3,	150	170	" 20	218	" 48
				[Total,	183 pounds.
4,	121	145	" 24	Killed 20th May.	

From 3d April to 22d April, the above swine consumed seven bushels and one peck of Indian meal. From 22d April to 25th June seven bushels of Indian meal, cooked as above.

One of the above, No. 4, was killed on 30th May; being absent, the live weight was not ascertained.

On the 25th June, the three remaining hogs were weighed, and in the 63 days from 22d April to 25th June, they had gained in that time 183 lbs. as above.

After 30th May, when one of them was killed, one peck of meal made into hasty pudding with a small allowance of the waste of the kitchen for a part of that time, lasted them three days, that is $\frac{3}{28}$ or less than a quart, say $\frac{7}{8}$ of a quart per day to each.

☞ At first we employed half a bushel of Indian meal to make a kettle of hasty pudding; but we soon found that a peck of meal by being boiled sufficiently would make the same kettle nearly full of hasty pudding and of sufficient consistency. The kettle was a common sized five pail kettle, set in brick work in the house; and it was remarkable that the peck of meal produced nearly the same quantity of pudding, that we obtained from the half bushel, which showed the importance of inducing the meal to take up all the water it could be made to absorb.

The price of Indian corn was at that time 75 cts. per bushel—30 quarts of meal to a bushel deducting the toll. The amount of meal consumed in the whole time from 3d April to 25th June was $14\frac{1}{4}$ bushels—the cost $10,69—the total gain, making no allowance for the gain of No. 4 from 22d April to 30th May, which was not ascertained, was 287 lbs.

The gain of No. 1, 2 and 3, from 22d April to 25th June was 183 lbs. in 63 days; and allowing one peck to serve the three hogs for three days, required $5\frac{1}{4}$ bushels, the cost of which was $3,94. The live-weight could not be estimated at less than 4 cts. per pound when pork was at market 6 cts.

The value of the 183 lbs. therefore was equal to $7,32, or at 5 cts. to $9,15 cts.

The gain of the swine for the first 19 days, from 3d to 22d April, was

No. 1, 26 lbs. or 1,368 per day.
" 2, 34, " or 1,789 "
" 3, 20, " or 1,052 "
" 4, 24, " or 1,263 "

The gain from 22d April to 25th June, 63 days, was,

No. 1, 62 lbs. or 0,984 per day.
" 2, 73, " or 1,158 "
" 3, 48, " or 0,761 "

The difference of daily gain in the two periods was attributable to the diminished quantity of meal. The question then arises, whether the first mode of feeding was as economical as the second.

In the first 19 days, 7 bushels 1 peck consumed, gave 104 lbs. gain.

In the next 63 days, 5 bushels 1 peck consumed, gave 183 lbs. gain.

Had the first gain been in proportion to the second gain in reference to the meal consumed, the $7\frac{1}{4}$ bushels which gave 104 lbs. should have given $252\frac{5}{7}$ lbs. This great disparity can be explained only in the more economical preparation of the meal, by which a peck, taking up as much water as it would contain, gave a kettle nearly full of pudding, when half a bushel of meal, imperfectly prepared, gave little more. This seems to demonstrate the great advantage of cooked food, both as it respects its increase of bulk and the improvement of its nutritive properties. Whether it would apply to those substances, whose bulk is not increased by cooking, equally as to Indian meal and the like, is a matter which experiments only can determine.

Such are some few trials in reference to the feeding and fattening of swine, which I have made, or information of which I have obtained from other sources, which may at least lead the inquisitive farmer to further experiments and inquiries, on a subject of great importance to his interest. The inferences to be made from them I shall leave to others. The results, as will be observed, are not uniform. The thrift of animals must depend on various other circumstances besides the kinds or

the quantity of food given them. Much depends on the breed, as every farmer knows; much on the health of the animal; something on the season of the year. I failed in attempting to fatten several swine in one case, though they were carefully attended and various kinds of feed were tried, and the failure was totally inexplicable until they were slaughtered, when the intestines were found corroded with worms, resembling those found in the human stomach, and this, I have no doubt, prevented their thrift. The same fact has occurred in another instance, and with the same result. I failed in attempting to fatten some other swine, who had been driven a considerable distance and exposed, probably not even half fed on the road, to severe cold and storms. Some of them were frost bitten in their limbs; and though attended and fed in the most careful manner they made no progress for months. In an experiment recently made, of giving swine raw meal mixed with water, I have found a falling off in their gain of nearly one-half, compared with giving their food cooked, such as boiled potatoes and carrots, mixed with meal while hot; the result being, in a stye containing a number of swine, as 279 to 500. In respect to confinement or freedom, various opinions are entertained. "Elder Turner, of New York, says, that hogs should never know what liberty is, but should be kept close all their lives, and as inactive as possible. That by this method double the quantity of pork can be produced with the same expense of feed."* F. Peabody, Esq. informed me that the Shakers at Canterbury, N. H. told him that they deemed it indispensable to the thriving of their swine that they should have access to water to wallow or wash themselves in; and that they by no means did so well without it. On this point I have had no trial farther than to satisfy myself that fatting hogs are injured by being suffered to root in the earth.

With respect to the age at which it is advantageous to put up swine to fatten, I have only to remark, that it is with swine as with other animals, there are some breeds which come much sooner to maturity than others. A successful farmer in Saratoga county, N. Y., says that March pigs, killed about Christmas, are the most profitable for pork. Four pigs of what is called the Grass breed, were slaughtered at Greenfield, New York, which weighed 348 lbs. 318 lbs. 310 lbs. and 306 lbs. at nine months and seventeen days old.

On this point, however, I take leave to present a letter with which I was honored by John Lowell, Esq. whose authority in the agricultural community is justly estimated.

"Boston, *April* 18, 1831.

"To Rev. Henry Colman.

"*Dear Sir*,—I have been prevented by the state of my eyes from answering your inquiries as to my experience in raising old or young pigs.

* * * * * I never *wintered* any pigs, as no person resides on my place from December 1st, to May 1st. It was therefore matter of importance to me to ascertain on what description of pigs, or rather of what age, the most flesh could be put in my limited time with similar treatment. I may say that I have fully and clearly ascertained, from a trial of 20 years, that young pigs of from 25 to 30 pounds, will give nearly double, in some remarkable cases three times, as many pounds as shoats of six months weighing from 100 to 150. I have taken two pigs of 100 lbs. each, age six months, and never was able between May and November, to get them above 180, rarely above 170. I have taken three pigs of about 30 lbs. each, and on the same food which I gave to the two they would weigh from 170 to 180 each in the same period;—nay I have taken pigs of 200, and never could get them to weigh more than 300 in 7 months on my food. The way I ascertain the quantity of food is that I never give any thing but the produce of my dairy, and the refuse of the garden, peaches, apples, and cabbage, which are uniform generally.

Three pigs of 90 wt. or 30 wt. each, will give ordinarily 510 lbs.
less original wt. 90 often not more than 60.
gain 420 lbs.

Two pigs of 100 wt. each, will give ordinarily 340 lbs.
less original wt. 200
gain 140 lbs.

"But the 3 pigs of 90 will not consume for the first three months half so much as the two of 100 each, and I have kept a 4th and sold it in August for quarter pork.

"There is nothing new or remarkable in these facts. It is the law of the whole animal creation. It is true of the calf and of man. The child of 7 lbs. quadruples its weight in 12 months; and the calf of 60 weight if fine and well fed will weigh 600 weight at the end of the year, and (if a female) will not double the last weight at any age.

* * * * * * * * *

"Yours, very respectfully,

"J. LOWELL.

"P. S. It should be remarked that the weight at purchase is live-weight, and at sale dead or net weight, because in truth to the owner this is the true mode of considering the subject. No doubt my sort of food is peculiarly favorable to young animals, it consisting in very liberal allowance of milk. If the older pigs were at once put on Indian meal they would attain to 250 at a year old, but the cost of the meal at 70 cents per bushel would amount to 9 dollars, and if the first cost, 5 dollars 50 cents, be added, and the pig sold at 6 cents, there would be but two dollars gain on two pigs of 100 lbs. each; while three small pigs without meal fed on milk would give 24 dollars in the same time. I do not mean to give minute details but general views. As an important qualification of the foregoing statement it should be added that shoats of six months bought out of droves have usually been stinted in their growth, and animals, like trees, recover slowly after a check. I presume if shoats were taken from a careful and liberal owner the difference would be less. But as a general law it may be safely affirmed, that weight for weight at the purchase, the younger the animal the greater the positive, and the far greater the net, gain. At least such is my own experience and belief."

* N. Y. Memoirs of Agriculture, Vol. 2. p. 50.

The foregoing letter of this intelligent and practical farmer is entitled to particular consideration. I have one or two other statements, which deserve attention. It is stated in the Domestic Encyclopedia, article Soiling, that "twenty-five shoats were fed for three months with green clover cut from less than one acre; they were then fed on Indian corn and when killed weighed three thousand pounds. This is certainly an extraordinary statement, and I have no other authority for it than what is here given. But the Rev. Thomas Mason, of Northfield, Mass. showed me the 27th September last, three fine thrifty swine about nine months or more old, nine-tenths of whose feed, as he assured me, since the 13th of May last, had been obtained from one-eighth of an acre of clover cut and given to them green.

The preceding facts and experiments encourage the belief that hogs may be raised and fattened by the farmer to advantage, where corn is worth about seventy cents per bushel, and his pork will bring him six cents per pound. Like almost every other business, especially of an agricultural nature, success must greatly depend on skill, care, selection, and good management. The best swine that I have ever found have been in dairy countries, for there cannot be a doubt that milk and whey for every animal are among the most nutritious of aliments. Indian meal probably ranks next, though many farmers prefer a mixture of provender, such as corn, oats, rye, or barley; but I believe in all cases cooked food will have a decided advantage over that which is given in a raw state: an advantage more than equivalent to the labor and expense of its preparation. Potatoes are a valuable article of food, but the pork is not so good as that fattened upon corn. Carrots are more nutritious than potatoes. Corn given in a raw state or on the ear is a most wasteful management.

Swine ought to be kept on every farm in sufficient numbers to consume all the offal and waste of the dairy and kitchen. If beyond this, a breed can be obtained, which will arrive at early maturity, and which can be advantageously grass fed or kept at a small expense and in an improving condition through the summer; and being put up to fatten early in autumn and forced as much as possible so as to be sent to market early in the winter, the farmer will ordinarily find a fair profit in this branch of husbandry. A very great advantage is found in the keeping of swine from the valuable returns of manure both in quantity and quality, which are obtained from them, where care is taken to supply them with raw materials for the manufacture. Too much care cannot be bestowed in the selection of the breed and the general health of the animal when put up to feed; and it is strongly recommended to every careful farmer occasionally to weigh the animal and measure the feed, that he may ascertain seasonably on which side the balance of debt or credit is likely to fall. Nothing is more prejudicial to good husbandry than mere guesses and random conjectures; and though the result of our operations may not meet either our wishes or expectations, an intelligent and reflecting mind will be always anxious as far as practicable to know precisely how far they correspond with or disappoint them. Truth, exact simple truth, in every thing, is the proper pursuit and the most valuable possession of the human mind; and more nearly than any thing else connected with man's true interest and happiness.

HENRY COLMAN.

Meadowbanks, Deerfield, 20th April, 1834

ON PLUCKING THE FEATHERS FROM LIVING GEESE.

From Moubray on Poultry.

A writer in the Monthly Magazine, December, 1823, remarks humanely on the cruelty of plucking the living goose, proposing a remedy, which I should rejoice exceedingly to find practicable and effective. He remarks on the additional torture experienced by the poor fowl, from the too frequent unskilfulness and want of dexterity of the operator—generally a woman. The skin and flesh are sometimes so torn as to occasion the death of the victim; and even when the fowls are plucked in the most careful manner, they lose their flesh and appetite; their eyes become dull, and they languish in a most pitiable state, during a longer or a shorter period. Mortality also has been periodically very extensive in the flocks of geese, from sudden and imprudent exposure of them to cold, after being stripped, and more especially during severe seasons and sudden atmospheric vicissitudes. There are many instances, in bleak and cold situations, of hundreds being lost in a single night, from neglect of the due precaution of comfortable shelter for as long a time as it may appear to be required. The remedy proposed, on the above authority, is as follows: Feathers are but of a year's growth, and in the moulting season they spontaneously fall off, and are supplied by a fresh fleece. When, however, the geese are in full feather, let the plumage be removed, close to the skin, by sharp scissors. The produce would not be much reduced in quantity, whilst the quality would be greatly improved, and an indemnification be experienced, in the uninjured health of the fowl, and the benefit obtained to the succeeding crop. Labor also would be saved in dressing, since the quilly portion of the feathers, when forcibly detached from the skin, is generally in such a state, as, after all, to require the employment of scissors. After this operation shall have been performed, the down from the breast may be removed by the same means.

A VILLAGE DEPOPULATED BY THE "MILK SICKNESS."

[The singular and fatal disease to which is ascribed the effects stated below, was described in Vol. 1, of the Farmers' Register.]

The following extract is of a letter from a traveller dated at St. Louis:

A few miles below Alton, on the Mississippi, I passed a deserted village, the whole population of which had been destroyed by the "milk sickness." The hamlet consisted of a couple of mills and a number of frame houses, not one of which was now tenanted: but the dried weeds of last year choaked the threshold of the latter, and the raceways of the mills were lumbered up with floating timber, while the green slime of two summers hung heavy on the motionless wheels. Not an object but ourselves moved through the town; and

the very crows themselves seemed to make a recruit around the fatal place when they came in view of the thickly sown burial ground on the skirts of the deserted village.

THOUGHTS ON REARING FRUIT TREES.

To the Editor of the Farmers' Register.

Prince Edward County, July 9th, 1834.

Much has been said and written, and a great deal of useful knowledge has been presented relating to the best modes of rearing orchards; yet by far the greater part of what I have heard and read upon the subject, has been but opinion bottomed upon nothing better than opinion, without any certain knowledge, or known facts, to sustain those opinions. The truth is, that orchards do well in some soils and situations, under almost any course of management, attended with the least care; whilst with like care and management, in other soils and situations, they utterly fail. Few persons live long enough, and still fewer are sufficiently observing and attentive, to draw any just conclusions, as to the best modes of rearing orchards of any kind of trees, which are long in coming to maturity, being for the most part utterly ignorant which may be the best, of any two modes which have been practised. Records have been still more rarely kept, and seldom contained much useful information, yet they must be the main reliance, for transmitting any large portion of valuable knowledge to posterity, upon all subjects which require many years to bring them to maturity.

It is now tolerably well understood, and believed to be the fact, that the stock of fruit trees wears out, and that they assume in early life, the decrepitude of old age, by being raised by grafting repeatedly from different sets of trees, raised the first from a vigorous seedling stock, the next from a grafted tree, the third from the second grafted tree, and so on: and the ill effects are thought to be greatly increased, by grafting from old bearing trees; which if true, as I believe it is, threatens in time to extinguish the different races of our best fruits. Is there any remedy known for this evil? I propose an alleviation: perhaps it may prove to be a remedy. Graft always with water sprouts or suckers, and never use limbs from the bearing part of the tree for grafting, nor any limbs that would probably blossom or bear fruit the same year they are grafted, if they had been left to grow on the parent tree. Trees raised by grafting with water sprouts, it is well known are more thrifty, than those raised by grafting with the bearing twigs; and equally well known, that the water sprouts require much longer time to arrive at the bearing state; from which it may be presumed they will be longer lived. To those who can afford the means, I propose what will perpetuate the same, or in all reasonable probability full as good stocks of apples and pears, and more certainly of all stone fruits. Plant seed of the most choice kinds in drills, say six feet apart; let the trees stand 18 inches apart along the drills, which will give 4840 trees to the acre. At this distance they may be forced to bear fruit in four or five years, when with good land and tillage, they will probably be an inch thick four feet from the ground—when, as soon as vegetation begins in the spring, cut round the bark of the trees, quite down to the wood, in two rings, rather less than a quarter of an inch apart, and take out the belt of bark entirely to the wood. Those narrow belts will commonly heal over before winter, and next year the trees will bear fruit, when all the worthless kinds may be destroyed, and the good may be preserved. If the good should not stand in such regular order as would be desirable for an orchard, twigs might be grafted from the best kinds in regular order, as there would be certainly a great abundance of stocks for the purpose. If only one tree in 100 should be of the same, or as good a kind as the seed sown, it would give 48 good kind of trees to the acre, which would be more than enough to raise to full growth in an orchard. It is doubtless known to many of your readers, that the discovery of forcing young trees prematurely to bear fruit, is not new, but has been published a considerable time. Its only use to which I have applied it, is in forcing young seedling and other unknown kinds of trees to bear fruit early, that I may not be at the trouble and expense of raising worthless trees to full growth for bearing before I know what kind of fruit they will bear—and that I may commence the rearing of good kinds at the earliest periods. If the belting at the height of four feet should cause the top of the tree to assume the appearance of age and decrepitude, it may be cut off at the belt, and suffered to form its top from limbs coming out below the belt. Trees of sufficient size and height, might be belted as high from the ground as might be desirable to top them, if four feet should be thought too low.

I can say little on the subject of pruning. I have found it sometimes of infinite service. No stout limb should ever be cut off near to the body of a tree, nor near to the trunk of a large limb, as decay immediately commences, and the trunk or body becomes doated, rotten, or hollow. If it should ever be found necessary to prune off stout limbs, let them be cut off smooth, at such distance from the trunk or body, that the stumps may not die down to the main limb or body of the tree. This will however be productive of considerable trouble, as the stumps of limbs almost invariably send out many sprouts, which it will be proper to keep pruned off.

It seems to me certain, that the best season for pruning, is from the time vegetation becomes active in the spring, till the descent of the sap; say from the first of April till the first of July. Wounds inflicted on trees at this season, commence immediately the process of healing, the wood appearing predisposed to re'ain life and soundness, up to the wound; whilst late in the fall and winter, wounds inflicted, become dead and dry to a very considerable depth, and and probably incipient putrefaction commences, before the process of healing begins. It may possibly be as well to prune later in the summer than the first of July; but I am inclined to the opinion that it is not. Pruning can be more conveniently done in winter.—Cuts or wounds in the sides of trees or limbs, having any considerable extent of branches above the wounds, heal more rapidly late in summer and in autumn than in spring; the case is different where the branch is severed entirely from the tree, which being done in the season of active ascending vegetation, will very soon show a ring of tender new bark, forming round the upper end of the limb where it is cut off, attempting to close in the wound.

I have seen most beneficial effects from wash-

ing fruit trees well with strong lie made from wood ashes, from pasting the bodies and limbs, as high up as can be conveniently done, with loblolly of wood ashes and water, and by white washing them in like manner with lime—the two latter of which applications, will commonly prevent hares from biting the trees.

CHARLES WOODSON.

REMARKS ON THE WOODSON AND CUNNINGHAM GRAPES.

To the Editor of the Farmers' Register.

Prince Edward County.

I will give you the history of the Woodson and Cunningham grapes* as they have fallen under my own observation, and the account from others of the discovery, with my opinion of their origin, properties, value, &c. The Woodson grape is one variety of a common, though not plentiful species, of indigenous grapes, growing wild in this part of the State, which I have seen occasionally from north of James River near Goochland Court House, to the southern part of this county, bordering on the middle and northern part of Charlotte, over a space of say 60 miles. The vine, leaf, and manner of its growth, are almost identical with the common black highland wild grape—the fruit about twice as large, the bunches considerably larger— the color of the fruit a brick-dust red, or bright brown, very nearly that of the Bland grape, but in which alone consists any striking resemblance between those two species. I consider it the most delicious variety of its particular species, the greater number of which are very sour. It is what I call a very fine eating fruit. Its great value consists in its heavy and almost unfailing production, having raised it and had it in bearing 26 years, without ever failing to have a tolerable crop in the time: generally the crops have been abundant. One year the fruit was all very imperfectly ripened and sour—another year about one-third of the vines did not perfect their fruit—this year the late frosts killed all the spring growth of blossoms and branches, and the second growth of branches have a thin crop of grapes which it is probable will not ripen perfectly before frost, as it is one of the latest kind of grapes. The first vine I ever raised of the kind, was grafted on a thrifty bearing vine of common wild grape, in the year 1807. The next year it bore a bushel basket full of bunches that were gathered at one time, besides a few that had been eaten at the vine. It has borne good crops, generally very heavy crops, every year but one since that time. The year it failed, I had great plenty on other vines of the kind. The best wine made in Virginia, which I have ever tasted, was the produce of this kind of grapes. In color and flavor, the wine approached nearer to Madeira than any I have met with. Its fruit is very sour and worthless, raised in cold or moist situations. Southern exposure and warm dry land suit it best. It is one of the most hardy and rigorous vines. I have never succeeded in raising it from cuttings, but by grafting; though Mr. Samuel W. Venable of this county has succeeded well. I have followed his instructions strictly, and uniformly failed, so I consider it unsafe to rely upon that mode of raising it. If a vine can be procured to live and grow from grafting, which is tolerably certain, or by planting vines with roots, it may be conveniently enough propagated by layers: to do which, a portion of the growing vine being fastened down on the ground, should be lightly covered with rich earth at the joints, leaving the tops of all the branches uncovered. If very lightly covered with earth, they generally take root readily. Too thick covering prevents the rooting kindly, and is liable to make the vines decay. The parent vine was found growing wild on the plantation of Henry Caldwell, (now Mr. Isaac Reid's) in what we call a hedge row or site of an old fence, near the top of a south hill-side, a small distance north of Fort Creek about a mile or less from its junction with Buffaloe River and Falling Creek, say five miles North West from Prince Edward Court-House. James Caldwell, son of Henry, gave me the first account of it in the year 1794, when he told me it had been known for a number of years to the family, who did not chose to show it to other people. Henry Caldwell was an old settler there, and I should suppose the vine to be older than any Bland grape vine that ever was raised in this county. I never found it till 1806, since which time it has been twice torn down from the trees by mischievous people, to get the fruit, and has been cut off at the ground. Its present top is of recent growth. I have met with only two other very good varieties of this species, both of which are in some respects inferior to this kind.

The Cunningham grape is quite a new kind. The parent vine, though now large, is but young. It sprang up in a corner of Mr. Jacob Cunningham's garden, and is (to almost a moral certainty) a descendant of the Bland grape, which had been raised there for many years. In all its most striking qualities and appearance, it resembles the Bland. The fruit ripens near the same time, is of the same color, not quite half the size, by actual weight, differs considerably in taste, and by some people is preferred. It is a stronger and more vigorous vine, and stands the rigor of our winters better than the Bland, which though seldom killed by our winter frosts, is frequently very much injured. It is of large growth, the leaves and bark being nearly identical with the Bland. In 1825 I first saw it, a very small bearing vine with extensive top: 1826 it grew astonishingly. In March of that year, I had some slips of it grafted on a vigorous young native grape vine in my garden—suffering part of it to run up on a stake, two other branches were extended on the ground in different directions, and covered at intervals with earth. It took root very kindly and its opposite ends are 40 yards apart. It could have been extended much farther in the time. I think it a certain, and tolerably plentiful bearer, and it is thought by an intelligent Virginian, who has resided many years in the wine county in the south of France, that it would be a superior wine grape. I have neither knowledge nor information on this subject.

CHARLES WOODSON.

MATERNAL TENDERNESS IN A SPARROW.

A sparrow, which had built her nest on the thatch roof of a house, was observed to continue

* An account of these grapes from another hand, was given page 89, vol. 1. Farmers' Register. Ed.

her regular visits long after the time when the young birds had taken their flight. This unusual circumstance continued throughout the year; and in the winter, a gentleman who had all along observed her, determined on investigating its cause. He therefore mounted a ladder, and found one of the young ones detained a prisoner, by means of a string of worsted, which formed part of the nest, having become accidentally twisted round its leg. Being thus incapacitated from procuring its own subsistence, it had been fed and sustained by the continued exertions of its mother.—*Raleigh Register.*

THE FENCE LAW IN VIRGINIA.

To the Editor of the Farmers' Register.

It is most lamentably true that the energies of agriculture are crippled, and partially paralyzed by legislative enactment—by the measures of our representatives, from whom we might expect protection. But they give us such "protection as eagles give to lambs, covering and devouring them;" and I am almost induced to say, if the laws passed on this subject were unlegislated it would be most wise legislation. I particularly allude to that law which renders it imperative on every farmer to keep his fields enclosed, or it is lawful for every kind of stock to depredate and fatten on his hard earnings. This is the heaviest tax we bear: and I think upon a mature examination of the subject, the universal cry will be "relieve us from this oppression." Let the subject be fairly brought to the examination of every mind—let the trammels of precedent and the mists of prejudice be banished—let the rays of truth and justice beam upon the subject, and we fear not the result. I would gladly see the Register become the arena in which the friends and opponents of the fence law would display their prowess. We are seeking after truth, we want facts, circumstances, or arguments in all their force to be produced to prove the necessity of a continuation of this system in a country so long settled as Eastern Virginia. Its evils have been declared, the reasons why it should be abolished have been ably sustained by some of your correspondents. The arguments remain yet unanswered. Shall silence on this subject be construed into a tacit acknowledgement that the system is indefensible and untenable? If so, let there be one simultaneous movement among the people—let us petition the next legislature for a redress of our grievances, a relief from the onerous load we bear—let petition follow petition until the table in the legislative hall shall groan beneath the weight of our grievances, and the walls themselves echo back our wrongs. If the present legislature like precedent ones, remain dead to the interests of agriculture, the people at the April elections will have the subject in their own hands, when they can make a proper disposition of it. It was not my intention to discuss the merits of the question, but endeavor to excite others to it, who have abilities adequate, nay even superior to the occasion. I sincerely hope that many able and talented advocates may rally around the standard of opposition that has been raised. Every principle of justice, economy, charity, good feeling towards the suffering beasts, require of our hands an abandonment of this system. The peace of neighborhoods, the neglected and suffering necessities of the widow and the orphan demand it. We fondly hope some of the valorous knights "whose evening thoughts and morning dreams are of kings, queens, and knaves," (for we are told such things are all the fashion at Richmond) will forsake the society of this royal fraternity, and give the subject a calm and deliberate investigation. Here is a new theatre for action—here honorable ambition would receive a rich reward—the gratitude of an intelligent, suffering community. How long shall agriculture hang her harp upon the willow? How long shall she chant her dolorous notes to the passing breeze? Let but the agricultural community rise in the majesty of their strength, and her redemption draweth nigh, and her delivery is at hand.

VIRGINIUS.

Prince George, Aug. 5, 1834.

THE VALUE OF LIME AS MANURE IN PENNSYLVANIA.

To the Editor of the Farmers' Register.

Charles City County, July 22, 1834.

I send you herewith enclosed, an extract of a letter written by a friend, in answer to some inquiries made by myself with a view to obtaining correct information on the use of lime as a manure in Pennsylvania; and the mode of farming, rotation of crops, &c. Should you deem them worthy a place in your paper, or as adding any thing to the interests of agriculture, they are at your service.

COLLIER H. MINGE.

In Virginia, the object of farmers is grain—in Pennsylvania, grass and grazing. Your courses of crops in Virginia succeed each other every three years—in Pennsylvania every six or seven years. By feeding cattle we improve our land—by ploughing, we reduce it. There is no land of mine that would stand your mode of cropping—which causes me to think that your land must be of the first quality, if properly managed. The use of the plough I admit, but object to the abuse of it, which is when you plough up more land than you manure, to gain five per cent. on the quantity ploughed up.

But to answer your inquiries. My farm east of the turnpike road contained 100 acres, of which about 85 was cleared land. This, when I purchased it, would not have produced more than fifteen bushels of corn per acre. If I should now say that it would produce forty-five bushels per acre, I think myself as near the truth as fifteen bushels when first purchased. Now for the mode of improvement. Lime was my dependence. In the first place, fifty bushels per acre was applied on the grass, to lie over the winter, or to be ploughed up in the fall for corn. In the spring before planting, fifty bushels more on the other side, making one hundred bushels of lime per acre. Now this field will be sowed in oats or barley. I now view my manure, to see how far it will go to give twenty bushels of wheat per acre in a fair season: if it will not go over the whole, I sow the remainder with grass seeds, like the rest, (clover and timothy) say four quarts of timothy, and six quarts of clover per acre. This land remains in grass until the remainder of the cleared land is all

limed at the rate of sixty or one hundred bushels per acre, and cultivated in the same manner. I now come to the place of beginning, when fifty bushels more of lime is added—the rule the same as above, respecting manure and grass seeds. I proceed on in this way until two hundred bushels of lime per acre, are on. This tract of land which I have just described to you, I graze—and cultivate only as much as will pay the laboring expenses. It has fed for five years past thirty head of cattle, of six hundred pounds weight, which has given twenty-two dollars per head. All the corn and oats that are raised on it are fed away to the cattle, and thus the manure is made very valuable. This method of feeding my offal grain is the same on the farm I live on. I sell my wheat and barley, and dispose of the other with my cattle, which in common I think the best market I can get.

I will now pass on to my experiment of improving land with lime alone, without the assistance of manure. I purchased a lot of land containing thirty acres. twenty of which was cleared, and had been thrown open as a common for some years, not worth making one hundred and fifty rails to enclose it, which with the rails on it made a reasonable fence. To test the quality of this land I had five acres ploughed and planted with corn. It did not produce me five bushels of good corn per acre. It being one mile and a half from my farm, no manure was drawn to it except about four bushels, to put in a gulley to stop its washing. I sowed these five acres in oats and clover seed, but they were like the corn, not worth half the labor bestowed on them. I now commenced and put on the twenty acres one thousand bushels of lime, suffering it to lie on the surface four years. I put on it occasionally sheep, calves, &c. The fifth year I layed on one thousand bushels more lime, making one hundred to the acre, all lying on the top of the ground. This was not fair play: it should have been ploughed each time, and well mixed. The seventh year I was applied to by a farmer convenient, to cultivate it on shares; he voluntarily offered me one-half the produce, delivered on my home farm. The produce was thirty-three bushels per acre, in corn. It was now sowed in oats, and produced forty bushels. With the oats, clover seed and timothy were sown, as usual. It was now pastured four or five summers, and one thousand bushels more lime was added, making one hundred and fifty bushels per acre. I now cultivated it myself, and the produce was forty-five bushels per acre in corn—oats and clover seed following: four years after this plouging I laid on one thousand bushels more lime, making two hundred bushels per acre.

First cost per acre, - - -	$14
Two hundred bushels lime at 16½ cents,	33
And two tons plaster at $10 per ton,	20

This land has given me for the last five years good six per cent. interest on the whole cost per acre.

In this experiment I have varied from my home method of farming, in respect to feeding my grain on the land. Not one bushel of grain was fed on it. One crop of corn was husked on the stalks, and cattle turned in to eat the remainder; the stalks were all drawn off as was all oat straw made. Thus the oats and corn now taken off amount to more than one hundred bushels per acre.

I saw your account of marling expenses—you can improve your land much cheaper than I can if your marl is as desirable as that specimen I gave you.* It must be fifteen years since I had some of that drawn out, and its good effects now are as plain as they were the first year.

GAMA GRASS.

To the Editor of the Farmers' Register.

Scottsburg, Halifax, Aug. 10, 1834.

The following observations upon the gama grass, are necessarily unsatisfactory and imperfect; but they may possibly throw some additional light upon a subject which has excited considerable interest. I am fully sensible that years of careful observation and extended experiment can alone satisfy the public mind about a matter of this sort. My object is simply to show the productive capacity of this grass, and to point out a few facts with regard to its habits and character, which may be of use in facilitating proposed experiments.

It is already known that gama grass is found upon the alluvial lands of the Roanoke, and its tributaries. The description given of it in the fourth number of the Farmers' Register, enabled me to recognize it upon the Dan. I have known it for many years, and have frequently been attracted by its luxuriance, but have hitherto looked upon it as one of the numerous species of flag in which our lands abound. Upon further investigation, I have been enabled to correct this opinion, and to record the following facts.

It vegetates readily upon every variety of soil, but with very different degrees of luxuriance. Upon lean stiff lands, for instance, the blades never exceed twelve inches in length; and I have seen spots of it upon very steril land where its greatest altitude was only a few inches. On the other hand, upon light sandy loams the blades will generally measure five feet in full growth, and the flower stems will occasionally reach an altitude of nine feet. It is evidently a species of maize, and to this circumstance it probably owes its name of "corn grass," and its value as provender. The grain possesses a pleasant farinaceous flavor, undistinguishable from that of Indian corn. When extracted from the horny substance in which it is imbedded, it is found protected by several thin laminæ, similar to those in which a grain of wheat is encased. It is a little smaller than the latter grain, and of a conical shape. There is a soft pulpy substance running from the apex to the base, corresponding in taste and color to the heart of a grain of corn.

Twenty bunches of this grass cut about the last of June, were found to weigh 107 lbs. green, making an average of five pounds to the bunch. The diameters of these bunches were generally about eighteen inches. Very few of them reached two feet. The flower stems were numerous and constituted three-quarters of the weight. The stems and blades however were consumed by animals with equal avidity.

It does not flourish upon "water sobbed," or marsh lands, however fertile. Or where it is in-

*This specimen contained 60 per cent. of carbonate of lime.

commoded by grass or weeds of any description. Indeed it seems almost as easily affected by these circumstances as Indian corn. On lands in fine tilth and unobstructed by other vegetation, the product of these bunches were from seven to nine pounds green hay. Nothing can exceed the rapidity with which it vegetates. It grew eight inches in six days after the first cuttings, and in twenty days the blades generally measured two and a half feet. From various experiments, I consider that one pound of green hay to the square foot is the ordinary product. In one instance sixteen pounds were obtained from a closely matted area of as many square feet. Upon a soil equal perhaps to the production of two and a half barrels of corn to the acre.

No satisfactory experiments were made to test the weight of the cured hay. At least they were confined to a few bunches only. I consider however two-thirds an ample allowance for all loss in the process of curing. I have avoided making any calculation from the facts given above, because I still feel a degree of incredulity about the matter, which nothing but time and extended experiment can effectually remove. Those who have more faith in figures may be easily convinced that ninety ton of green grass to the acre is a moderate allowance.

I must not omit to state an experiment I made in planting. Two acres of land were selected similar to that upon which I found it growing with luxuriance. It was laid off by Mr. Meares' direction, and planted by slightly covering small portions of the root. The result was very unhappy: a great portion never after saw the light—and what did come up was smothered by the weeds. There were however a few bunches planted with the tops above ground: these were once worked, and are now flourishing. Were I to repeat the experiment I should make use of larger sets, and leave their tops exposed. The land should be regularly cultivated until the extension of the roots forbid the introduction of the hoe or plough. This I am well convinced is the only way of cultivating it to advantage.

The process of curing gama hay is simple. Two days exposure to the sun is sufficient. It may then be thrown into shocks with safety. In this situation it will withstand weather which would destroy clover hay. This I know from observation, and it is owing to the structure of the blade which by a little care in arranging renders the interior of the stack or shock impervious to rain.

I have used several hundred weight of this hay during the summer, and have generally found it preferred to clover or herd's grass. But whether it could be substituted with profit for these long established grasses, I am unable to decide. This much however may be said in favor of clover and red-top, that where lands are cheap and continually deteriorating as they are in Eastern Virginia, they constitute the cheapest means of restoring them to fertility, and at the same time afford an abundant supply of provender. It is of little consequence under such circumstances, whether our hay is reaped from one or five acres: the additional labor is the only difference, and that is scarcely worth calculating. As far as improvement is concerned, the fine turf and rich herbage of clover and herd's grass are in my humble opinion, of incalculable more importance to the interests of agriculture than gama grass and its hundred tons to the acre.

It may be said that the cultivation of all of these grasses at the same time is not incompatible. We doubt it. The introduction of gama grass would eventually banish the others, by giving fresh impetus to the ruinous system hitherto followed in many parts of Virginia, of extending the surface of cultivation without any regard to improvement. On the other hand, clover and red-top insure a compulsory reformation of this system, by confining our operations to a smaller space, and giving more leisure for enriching these contracted scenes, whilst the rest of the farm is gradually undergoing the enriching effects of luxuriant herbage.

HENRY E. SCOTT.

THE PROFITS OF THE DAIRY COMPARED WITH THAT OF FATTENING ANIMALS.

From the Genesee Farmer.

"It has been stated on the authority of the Board of Agriculture, and upon incontrovertible data, which any farmer or cow feeder may ascertain for his own satisfaction, that the quantity of herbage that will add 112 lbs. to the weight of an ox, will, when bestowed on a dairy cow, of ordinary good breed, and in fair condition to yield milk, enable her to yield about 2700 imperial pints of milk. And, as it is well known that, even in Scotland, where milk often contains more cream than that of cows fed on richer pasture; yet, in general, 17 pints of milk will yield an imperial pound of butter; and the buttermilk will sell at 1d. the three pints; and, as 120 pints of that milk will yield from 16 lbs. to 17 lbs. averdupois, of full milk or Dunlop cheese, it is easy to ascertain whether the 112 lbs. of beef, or these quantities of butter and buttermilk, or of cheese, will realize the greatest sum. The 2700 pints of milk will yield nearly 385 lbs. or 27½ stones imperial of full milk cheese; and, if made into butter, they will give nearly 157½ lbs. besides the buttermilk, which would about amount to half the quantity of milk churned. The average price of beef, for seven years past, has not exceeded 6s. per English stone; and the 112 lbs. of course amounts to £2 8s., while 27½ stones of cheese, at 5s. per stone, the average price paid by the merchant to the farmer, during the last seven years, amounts to £6 17s. 6d.; and the average price of 157 lbs. butter, at 8d. per lb. for the same period, amounts to £5 5s., and the buttermilk to £1 17s. 6d. more, or both to £7 2s. 6d.; so that the average price of the cheese exceeds that of the beef to the amount of £4 9s. 6d.; and the butter and buttermilk give £4 14s. 6d. more than the beef produced from the same quantity of food to the cattle."

The above extract is from the Quarterly Journal of Agriculture for March, and was promised some weeks ago. Let us apply its leading facts to our market. We will assume, that the price of beef in our large towns is upon an average $5 per cwt., of butter 16 cents per lb., and of full milk cheese 7 cents. The result would be this:

112 lbs. of beef, at 5 cents,	$5 60
380 lbs. of cheese, at 7 cents,	26 60
157 lbs. of butter, at 16 cents,	24 12

These facts, at all events, are worthy the consideration of cattle farmers.

ON ASHES AS A MANURE.

From the Genesee Farmer.

From a letter just received from a correspondent in Pennsylvania, we make the following extracts. We are aware that many of our Genesee farmers consider the use of ashes as a manure at least doubtful,—ascribing its supposed inefficacy to some peculiarity either in our soil or climate; but we have not been disposed to adopt this opinion. In fields which yield large crops, the difference of a few bushels to the acre, is scarcely perceptible; and it follows that the value of a manure which produces such difference, may be much under-rated. Yet it is evident that five bushels of Indian corn, added to the forty or fifty bushels which the land would produce without manure, are worth as much to the farmer, as when that addition is made to the product of more steril lands; or when it increases the crop from twenty to twenty-five bushels an acre.

We want experiments in the western parts of this state, on the subject of ashes as a manure. We believe that farmers, instead of selling unleached ashes at their doors for six cents a bushel, would find it more profitable to keep them for their own use, and to apply them to their own corn fields as manure.

"I put a small handful of unleached ashes *into* each hill of corn at the time of planting; and I think this way is better than to put it on the hill after the corn has come up. Last season, I dressed a few rows of corn with it, and am satisfied it is fully worth seventy-five cents a bushel for this purpose. These rows alternated with others, so that the experiment was fairly tried; and the difference was apparent through the whole season. There was a gain of at least five bushels to the acre. The ashes cost fifteen cents a bushel, the quantity not exceeding three bushels to the acre.

"This year, I bought potash for soap making, so that I might save my ashes for manure, *unleached*. I am satisfied that *leached* ashes are not worth near so much; yet with the latter, the corn was much better than in that part of the field which had no ashes."

PROCESS OF MANUFACTURING INDIGO IN SMALL QUANTITIES FOR FAMILY USE.

By Mrs. N————, of North Carolina.

From the Southern Agriculturist.

Mr. Editor,—Cut the Indigo when the under leaves begin to dry, and while the dew is on them in the morning, put them in a barrel, fill it with rain water, put weights on it to keep it under water; when bubbles begin to form on the top, and the water begins to look of a reddish color, it is soaked enough, and must be taken out, taking care to wring and squeeze the leaves well, so as to obtain all the strength of the plant; it must then be churned (which may be done by means of a tolerable open basket, with a handle raising it up and down) until the liquor is quite in a foam, you must try when it is done enough, by taking out a spoonful in a plate, and putting a small quantity of *very strong lie* to it. If it curdles, the indigo is churned enough, and you must proceed to break the liquor in the barrel in the same way, by putting in lie, which must be as strong as possible, by small quantities, and continuing to churn, until it is all sufficiently curdled; care must be taken not to put in too much lie, as that will spoil it. When it curdles well with the lie, it must be sprinkled well over the top with oil, which immediately causes the foam to subside, after which it must stand till the indigo settles to the bottom of the barrel, which may be discovered by the appearance of the water, which must be let off gradually, by boring holes first near the top, afterwards lower, as it continues to settle; when the water is all let off, and nothing remains but the mud, take that and put it in a bag, (flannel is the best) and hang it up to drip, afterwards spread it to dry on large dishes.

Take care that none of the foam, which is the strength of the weed, escapes; but if it rises too high, sprinkle oil on it.

ON THE SELECTION OF SOILS FOR A VINEYARD.

Hancock County, (Geo.) July, 1834.

From the Southern Agriculturist.

Mr. Editor,—Six or eight years ago, a desire to cultivate the vine, seemed to be spreading so extensively through South Carolina and Georgia, that by this time it was expected we should have, if not abundant supplies of good domestic wine, at least such reports of progress as would furnish valuable directions to adventurers of the present day. For such reports I have looked in vain to the pages of your useful repository, and other accessible sources of information. It was never probable, that every vine planted would succeed well, because too little was known in this country of the culture, eligibility of soils, or variety of the vine to be planted. Except Mr. Geiger, Mr. Herbemont, and a few others in Carolina, and perhaps about the same number in Georgia, I have heard of no experimenter, whose achievements in wine-making, can be regarded as at all encouraging. Every one has raised vines, which in the spring season, give fair promise of fruit; but unluckily before vintage, mildew, rot, or some other form of malady, seems, in most instances, to have destroyed most or all of the crop. Such, at least, has been the fate of mine, and several other small vineyards within the range of my observation, though I have remarked a few notable exceptions.

A knowledge of the causes of failure and of success is in great demand by all who think of prosecuting this interesting branch of cultivation; and this cannot, so certainly and conveniently be had, in any other way as by detailed accounts of experiments, setting forth the mode of planting the vines, the kind of earth in which they may have grown—whether clay, sand, or loam predominates—the name of the vines, method of tillage and training, together with the experimenter's own remarks on the subject. It is in the hope of drawing from some of the readers and patrons of the *Agriculturist*, that I ask the publication of this article.

It has been said, I know, that an annual excision of the superficial roots of the vine, so as to force the plant to subsist and propagate fruit, by the roots more deeply rooted beneath the surface, would be found a security from mildew and rot. This mode of treating vines is often practised in this country, and possibly with beneficial effects.

Mine, however, which grow thriftily in a deep sand have not matured one half the fruit.

It has also been said, that sandy and rather poor land produces more perfect and richer berries than soil of greater fertility, and more largely mixed with clay. This, too, is contradicted by my observation. By far the most thrifty and valuable vineyard, I ever saw, comprising six or eight varieties of the grape, on about seven acres, is now cultivated in the county of Jasper, (Georgia) on a high hill of pretty rich red clay and very stony. I saw it last July in full bearing, the fruit just beginning to ripen, and not a berry diseased, except a few Isabellas, and, perhaps, one other variety, the name not now remembered. The excessive wet weather of last spring was fatal to grapes growing on sandy soils; yet the vineyard in Jasper, on red clay, was never more prolific, yielding, as I understand, between one and two thousand gallons of wine, which the skilful and fortunate cultivator, Col. Alexander, sells readily at from one and an half to two and an half dollars a gallon, when above one year old. But this was not the only instance of pretty uniformly good crops being produced on rich red clay lands.

What time may do for vines which grow on poor and sandy land, our brief experience in the culture of the article has not yet shown—such lands, I know, are recommended by most European writers; yet it is well known that in a state of nature, it is our rich woodlands only that produce our thriftiest vines and the richest fruit. The experience of Europe may be different, or as has been often stated, and yet no safe guide in this respect to the American adventurer.

The most productive vines I ever saw, is the mother of that family of excellent grapes, known as the "Devereux grape." It stands in my neighborhood, is now thirty years old or upwards, and has been trained on arbors to the length of one hundred feet or more—never much pruned—produces a good crop every year, and grows in soil almost as rich as manure can make it. I have a number of thrifty vines of the Devereux grape in a vineyard of rather poor sandy land, which have not perfected fruit oftener than one year in three since they began to bear—they may do better when older; but from the facts that have fallen under my notice, I would, for the location of a vineyard, select the richest red clay of suitable elevation that I could find. Long spells of rain, will, I fear, ruin the fruit of any vines in this country which grow on beds of deep sand—unless, indeed, such consequences may be averted by copious applications of manure.

HIGHLANDER.

OBSERVATIONS ON THE RED LANDS OF THE SOUTH WEST MOUNTAINS.

To the Editor of the Farmers' Register.

I observed in looking over the September number of the Farmers' Register, in an article signed "A Gleaner," a notice of horizontal ploughing, as adopted in Albemarle, and as he supposes now abandoned. It certainly is abandoned in the breaking up of land, but not in the culture of the corn—the crop being planted, or attempted to be planted, in horizontal drills very generally laid off by the eye. It is true that the eye of every ploughman is not as accurate as that of a gentleman who had discovered that water would run up hill, (for you must know he had the most accurate eye in the world, and he had discovered by it that water had run from a lower to a higher point) —but sufficiently accurate for practical purposes, to keep the water dispersed, and prevent wide breaches through the field. In breaking the land with the large plough, the old system of beds both straight and horizontal are disused, for the more expeditious and efficacious spiral method; that is going round the base of the hill and terminating at the top. The mould-board being kept always from the hill, the earth is moved a smaller distance, and tumbling over more, leaves a freer and wider furrow. The growing practice of cultivating corn, on turf, or clover, and the disuse of the small plough and coulter, (depending exclusively upon the superficial work of the cultivator, and trusting to the decomposition of the vegetable matter to mellow the land, which is more permanent and effectual than the plough or coulter, better for land and crop,) will lead to the entire disuse of the horizontal ploughing, except upon stubble or clear land, or for the relief of teams on very broken fields. It may well be doubted whether horizontal ploughing would be useful upon lands less permeable to water than the red lands of the South West Mountains. They are so, in a very remarkable degree—and if the water can be arrested for a moment it goes into the earth. It is a friable clay, without sand; its aperient, is a round iron ore from the size of the point of a pin to a partridge shot, rolling when it comes in contact with the plough, which never cleans itself unless the land is perfectly dry. It is adhesive in a high degree when wet, yet not cohesive except when dry; adhering to your feet most inconveniently, yet not cohering sufficiently unless hard trod, or turfed, to be turned over by the plough; but shoving aside like dry sand. The clay breaks in cubical fractures. These after lying tempered in brick mortar forty-five hours, moulded and remaining until the brick has acquired consistence enough to bear handling, will be found to be dry when taken from the centre of the moist brick, having resisted the action of the water. When ploughed in the fall it is acted on by frost, and becomes very light. A hare may be tracked across a field as through snow. Light enough almost to be blown by the winds, yet this is the condition in which it will not wash. The writer of this article recollects to have had a very steep field in the shape of a half funnel, in this condition in the winter of 1822–3, exposed to a rain of nine inches and a quarter, falling in about fifteen or eighteen hours, without the slightest washing, except where the water burst out of the earth and run a few feet before it disappeared. A very small portion reduces to an impalpable powder; yet that is so minute as to penetrate the best made new boot. It exhibits no appearance upon the surface of being dissolved by water. Clover seed falling into holes, is found after a rain not imbedded in a clay or soil deposited by water, but clear and distinct upon the surface, as if the water had held none in solution. A thin crust forms on the surface in spring (which does not crack in drying) sufficiently hard to cause clover seed to lie on it as a rock, and perish; or should a root perchance penetrate, it enters a loose coarse soil, badly adapted to its vegetation; hence it is, without the roller, precarious in the extreme, for a crop of young clover;

yet when it gets hold, no land produces more vigorously or is more improved by it. Vegetable matter corrects many of its defects. It pays well him who cultivates well—it starves him who cultivates badly. A crop is never drowned by wet. No land stands drought better. It washes as little under good culture as any land—as much under bad. Grass was not indigenous, except a few late summer grasses and coarse weeds. You now find the clover, the sassafras and the brier, struggling for the mastery—the clover taking it the first crop, the sassafras and brier the second. It was originally very fertile, and tempted at an early period capitalists, who desolated it with their tobacco, their overseers, and their negroes. The first step at reclamation with many has been achieved; the surface is smoothed, and again produces vegetation; but the most advanced are far from a maximum. It will be a rich district. The energies of the soil when properly developed, are of the most vigorous character.

Lands more soluble in water, acquire a compactness under the action of hasty rain, which cause them to admit the water more slowly. Your horizontal furrows fill to overflowing—one breaks over into the one beneath it—that into a third—thus the water becomes embodied, and produces the evil you desired to arrest. The red land of the South West Mountain if ploughed so deep that the water cannot float, the whole surface admit it like a sieve, and it passes off into a substratum two or three feet below, as is proven by roads worn on hill-sides, which no matter how elevated, invariably become springy in wet weather.

Your correspondent quotes a passage from Arator, viz: "hilly lands will admit of narrow ridges as well as level, by a degree of skill and attention so easily attainable, that I observed it *to have existed in Scotland* above a century past, under a state of agriculture otherwise execrable, and among the ignorant highlanders." Did the author of Arator intend to convey the idea that horizontal ploughing existed in Scotland a century ago? Lord Kaimes (I quote from memory, not having a copy of the work, and therefore cannot give his words) in speaking of this crooked ploughing of Scotland, does not call it horizontal, but speaks of it as without object, resembling the uncertain zigzags of an animal walking uncontrolled through a field. This expression could not have been used where crooked beds were designed for a particular object. Arator has certainly fallen into an error on this subject.

The rain being over, and my horses done eating, Mr. Editor, I must take my leave of you. Don't be surprised that one who follows the plough daily should quote Lord Kaimes to you. It is not always the case that those who have most leisure, have most learning.

A FURROW TURNER.

EXPERIMENTS ON GAMA GRASS.

For the Farmers' Register.

Among the different experiments I have made for the purpose of ascertaining fully and correctly, the various modes in which the *gama grass* may be advantageously used in feeding cattle, and for which purpose it seems to me admirably calculated, I have been much gratified with one, on which I stumbled, and the result of which may be worth communicating.

Having been in early life much accustomed to, and a close observer of Pennsylvania farming, I was much pleased with the German economy of increasing forage for their cattle, by the aid of art, in *mixing* food—they being assured that the process adds to the capacity of each ingredient, for furnishing nutritive properties.

This theory they put in practice throughout many parts of the state, in their mode of putting up *green clover*, as a forage for milch cows during the winter; not only preserving, as they believe, in a superior manner the fine qualities of the clover, but augmenting equally the quantity of forage. As fast as the clover is cut, they stack it, mixing equal quantities of well preserved straw, and a small portion of *salt*, sprinkled regularly over the clover as the layers are completed. The gratification with which the cattle appear to feed on this preparation throughout the winter, I early noticed, especially when it was cut up in the box, and served out to them in troughs—one tin pint cup full of rye, or Indian meal, seasoning the food of a day, when confined to their stalls.

I once had the pleasure of witnessing an experiment made by an inteliigent German farmer, to ascertain the advantage of steaming this preparation, before feeding, and was much pleased with the result. The milk evidently was increased twenty-five per cent., and the capacity of the food for giving out its nutritive qualities, almost the same.

A recollection of this fact induced me to endeavor to imitate the course of the intelligent German; and commencing the last July, I built up a considerable stack, of equal quantities of *gama grass* and *wheat straw*, in thin layers, taking the grass from the scythe, and on each layer of grass, as I built my pile, sprinkling a little salt (ground alum;)—straw; then grass and salt. The straw was in a state of perfect preservation. The stack was built in the old Pennsylvania barrack fashion, a good thatched roof, moving up and down, as required, on fixed posts.

On the 1st of December, I found the preparation sweet and in fine preservation, and commenced feeding four favorite milch cows, in a trough, under an open shed in my "dung stead." This shed was protected on the north and west. The preparation I cut up in a patent cutting box, to about one inch—this was the work of *rainy days*, two hands cutting several hundred bushels per day; as cut, it was packed closely away in a small apartment in my cutting room, to be used as required. On taking the cover from the stack, or barrack, it gave out a fine flavor, resembling that discoverable on opening a stack of well preserved corn blades. This I wished to preserve as much as possible, believing it to add to the gratification of the animals while eating it, for I found that after my cattle were accustomed to the preparation, on going up to a bundle of *straw*, they would smell it strongly, and immediately go in search of another, but never leave that one mingled with the grass.

In the morning, previously ascertaining the quantity requisite to feed on to 12 o'clock, I put it in the troughs, sprinkling it with a liquid (I kept always ready by having two casks) composed of water and corn meal, in which the vinous fermen-

tation was completed, and the acetous slightly commenced. The result of this feeding, whether as regards economy, or success in supporting cattle in good plight, I am fully satisfied with, and I beg leave to suggest the trial to all those who are now cultivating this grass.

I took the wheat straw intentionally, knowing that straw was held in the least estimation by cattle raisers—I shall hereafter subject all my straw to the same process. I made a little of the preparation with rice straw, a grain we raise with admirable success, on even our pine lands—and some with rye and oat straw. These three last, I found my mules eat voraciously, and to eat which, my best fed horses appeared 'nothing loath,' especially that in which the oat straw was combined.

For all my dry cattle, work steers, mules, and horses, I shall cut the grass hereafter, at *one month's growth*, say seven cuttings during the season.

I have occasionally observed, that some gentlemen feel doubtful, in spite of the hundred testimonies that have been given to the public, respecting the astonishing productiveness of this grass. Having it in a fine state of cultivation, on *pine land*, the soil about as well managed and manured, as a good Virginia farmer manures and manages his clover field, I will give the product of a part of a lot of it, during the last year, which was a favorable season with us.

I laid off a piece of ground, one hundred by fifty feet—the plants previously at two feet distance. Cut on the first day of May, and monthly, until the first day of November inclusive. The production averaged *ten and a half pounds* at each cutting, from each plant or root. In the month of June, I sprinkled rotted *cotton seed* over the ground —at each cutting loosened the ground between the plants with a narrow hoe. Previous to planting, I gave the ground a coat of lime.

AGRICOLA.

Clarke County, Alabama.

AGRICULTURAL SOCIETY FOR KING WILLIAM, AND KING AND QUEEN.

For the Farmers' Register.

At a meeting held agreeably to notice, at Aylett's, on the first of August, 1834, for the purpose of organizing an agricultural society for the counties of King William, and King and Queen—on motion, Dr. William B. Westmore was called to the chair, and Thomas Haynes appointed secretary.

1. *Resolved*, That a committee of thirty-one be appointed by the chairman to draft and report a constitution at our next meeting, which committee being appointed—on motion, the chairman was added to the committee.

2. *Resolved*, That some suitable person be appointed to deliver an address at this place, on the third Wednesday in October next, for the purpose of promoting the objects of this meeting.

3. *Resolved*, That Mr. John Gaines be appointed to deliver the address, and in case of his failure the chairman select some other person.

4. *Resolved*, That the secretary inform the absent members of the committee, appointed to draft a constitution, of their appointment, and earnestly solicit their co-operation.

5. *Resolved*, That Dr. William B. Westmore act as chairman of the committee.

6. *Resolved*, That a copy of the proceedings of this meeting be forwarded to the editor of the Farmers' Register, with a request for him to publish them.

On motion, This meeting is adjourned to meet on the third Wednesday in October next.

WILLIAM B. WESTMORE, chairman.

Thos. Haynes, sec'ry.

AGRICULTURAL SOCIETY FOR BUCKINGHAM.

For the Farmers' Register.

At a meeting of a number of gentlemen at the house of Robert Shaw, esq., in the county of Buckingham, on the 29th of August, 1834; the object of which being the formation of an agricultural society—on motion of Dr. Wm. Moseley, Robert Shaw, esq. was called to the chair, and Wm. N. Patteson appointed secretary.

On motion of Col. Thomas M. Bondurant, resolved, that a committee of eight be appointed to prepare and submit to an adjourned meeting, a constitution for the government of said society: whereupon, the chair filled the blank with the names of the following gentlemen: Thomas M. Bondurant, Wm. Lewis, Wm. N. Patteson, Dr. Wm. C. Moseley, Dr. James M. Austin, George Moseley, P. H. Hickok and Dr. Wm. P. Moseley; and on motion, the chairman was also added to said committee.

On motion of Maj. George Moseley, resolved, that the members of this meeting constitute a committee, whose duty it shall be to make known to the citizens of this county, the object of this meeting, and to invite their attendance, and request their co-operation therein.

On motion, resolved, that when this meeting adjourn, it be to meet at this place on the 9th of September next.

On motion of Maj. James M. Patteson, resolved, that the foregoing proceedings be forwarded to the editors of the Richmond Whig, Richmond Enquirer, Virginia Advocate, and Farmers' Register, with a request that they publish the same in their respective papers.

On motion, resolved, that the proceedings of this meeting be signed by the chairman and secretary.

On motion of Wm. Lewis, esq., resolved, that this meeting adjourn.

ROBERT SHAW, chairman.

Wm. N. Patteson, secretary.

FIELD PEAS AFTER WHEAT.

To the Editor of the Farmers' Register.

King and Queen, Aug. 12, 1834.

Permit me to call your attention for a moment to a pleasing fact which has recently occurred on my farm. There is now on a part of my stubble field, from which wheat was taken the last week in June, a fine growth of pea vines (volunteers) which have sprung up since the wheat was taken off.

The land was cultivated in corn and peas last year, and at the proper time to seed wheat, say

about the 18th of October last, the corn was removed, (the peas having been previously gathered,) and the land laid down in wheat.

No doubt but that some of the peas were left on the land, ploughed under with the wheat, and remained in *statu quo* all the winter. I am now clearly of the opinion that it would be highly beneficial to our poor sandy soils, where clover will not take well, to sow one bushel of black eyed or Jefferson peas, per acre, at the time of seeding wheat, taking care not to commence, in order to prevent the peas *vegetating* at that season of the year, before frost, or cold weather. Indeed, with us, it is very unsafe generally to sow wheat sooner than the 15th of October; seeded earlier it is almost certain to be destroyed by the fly.

This system of improvement possesses several very important advantages. 1st. The expense will be only about sixty or seventy cents per acre. 2d. There is no extra fallow, harrowing, or labor of any kind—and 3d. The land is not at all exposed to the action of a hot sun, which must necessarily be the case where you fallow for a crop of buckwheat or peas. The *tory*, or *black pea* is admirably adapted to this system, for it will bear the most rigid exposure, and produces a most luxuriant cover of vines.

[The honorary Silver Medal having been offered as a premium for the best account of experiments made, to ascertain what advantage may be derived from plucking off the flowers of the potato, it was adjudged to the author of the following Report.]

REPORT OF AN EXPERIMENT MADE AT ABERDONA, TO ASCERTAIN THE BENEFIT RESULTING FROM THE REMOVAL OF POTATO-BLOSSOMS.

By Mr. JAMES MURRAY.

From the Prize Essays and Transactions of the Highland Society of Scotland, [March, 1834.]

The experiment was made according to the plan laid down by the Highland Society in their list of premiums for 1833.

The quality of the soil was not the best adapted for a very successful potato crop, but as I did not think of making the experiment until after the ground had been sown, I had no alternative left me. At the same time, I believe that an experiment of this nature, although made upon a crop raised in soil not peculiarly well adapted for its culture, will be quite as satisfactory in determining the advantages of it, as one made upon a more congenial soil. The soil consisted throughout the two acres upon which the potatoes had been sown, of a shallow loam, upon a bed of what is generally called till. The field had been well drained, but like every other field of the same nature of soil, (unless where Mr. Smith of Deanston's trenching plough may have been used,) continues in what may be called a cold, damp state, and therefore an enemy to the potato.

The variety of the potato sown, was one which had been brought from Ireland some years ago by a gentleman of this neighborhood, and is called the red potato in this neighborhood.

I divided the whole field into parts of *three* drills each, and having explained what I wished to be done to a few children of from nine to twelve years old, previous to the appearance of any blossoms, they never allowed a day to elapse, without looking after their charge, and no sooner had a blossom begun to appear, (or in bud,) upon No. 1. of each part, than it was certain to be immediately plucked off. The other two drills of each part remained untouched until the blossoms upon No. 2. seemed to be fully expanded, when they were also plucked off, while No. 3. was allowed to ripen its fruit. By arranging the drills in this manner, I could depend on being more correct in having the soil of each of the drills of each part exactly similar than I could have been, had I divided the field in the manner proposed by the Society.

The preceding part of the experiment was (as it must appear to be) very simple indeed, and attended with no expense whatever, for there are always children in the neighborhood of a farm, who will do the work for a few pence a-day.

The most difficult part of the experiment to arrange, was the taking up of the crop, so that there might be no interference between the different drills. To obtain this, I took three carts, one of which was appropiated entirely by No. 1. of each part, another by No. 2. and the remaining one by No. 3. In this manner I prevented the very slightest mingling of the potatoes.

The quantity of potatoes which each cart held, was exactly ascertained, and the management of this part of the experiment being given to one person, it was his business to mark down how many loads each cart took to the potato-pit.

After the whole crop had been taken off the field, and the overseer's note-book examined, the following was the result:—

Drills, No. 1. being those from which the blossoms were plucked in the bud, contained 30 bolls 2 bushels.

Drills, No. 2. being those from which the blossoms were plucked when in full flower, contained 27 bolls 3 bushels.

Drills, No. 3. begin those upon which the fruit was allowed to ripen, contained 26 bolls.

The superiority, therefore, of No. 1, over No.2, was 2 bolls 5 bushels; over No. 3, was 4 bolls 3 bushels; and of No. 2 over No. 3, was 1 boll 3 bushels.

From the above experiment it would appear, that the potato crop had been improved by having the blossoms plucked off, and that according to the period at which it had been done. At the same time, the difference is perhaps not much more than would be counterbalanced by the additional trouble given in taking up the crops; for, although regulated as well as possibly could be done, still it could not be taken up in nearly the time in which it would have been done, had the drills been resorted to indiscriminately.

The quality of the potato is remarkably good, it is of a mealy nature, and an uncommonly good keeper. We were using them last year here, in preference to early potatoes.

Aberdona, Alloa, November 1833.

GEOLOGICAL SURVEYS.

From the Southern Religious Telegraph.

By the following notices it appears that a new interest is awakened in respect to the geology of different portions of our country.

The legislature of the state of Tennessee, has appointed Dr. G. Troost, a distinguished naturalist, geologist of the state. He has already made a report in part, containing a geological survey of Davidson county.

Mr. G. W. Featherstonhaugh is at present engaged under the authority of the United States government, in investigating the geology and mineralogy of Arkansas territory. It is expected that he will report to congress in February next.

Mr. S. G. Clemson, who has recently returned from Europe, after a long and faithful apprenticeship in the school of mines at Paris, has accepted the appointment of the Geological Society of Pennsylvania, to visit and report on the gold region recently discovered in York county, Pa.

The legislature of Maryland have appointed Professor Ducatel and Mr. Anderson, of Baltimore, to make a geological and topographical survey of that state.

The Geological Society of Pennsylvania, have it in contemplation to appoint a committee of their members to make a geological survey of Schuylkill county for which purpose part of the necessary funds have already been subscribed.

[To the author of the following Report, the result of five years practical experience, the thanks of the Society and the honorary Silver Medal were voted by the Directors.]

REPORT ON THE VALUE OF BONE-MANURE, IN COMPARISON WITH ORDINARY FARM-YARD MANURE.

By the Honorable Captain W. Ogilvy, Airlie Castle.

From the Prize Essays and Transactions of the Highland Society of Scotland.

Mr. Watson of Keilor introduced the use of bone-manure into Strathmore, having seen it used in England. I am not certain in what year he began to make experiments with it, or to employ it extensively, but I remember well that the great deficiency of farm-yard dung in 1827 (consequent on the almost total failure of the crop of the previous year) first induced me to try four acres of turnip without other manure, sown with 15 bushels of bone-dust per acre, which I obtained from Mr. Watson: it cost 3s. per bushel, or £2 5s. per acre. The crop of turnip on these four acres was at least equal to the rest raised with farm-yard manure; but as the whole of the turnips were pulled, and the land received some dung before the succeeding crop, much stress cannot be laid on the circumstance of the following white crop and grass being good.

Next year, 1828, encouraged by the former successful experiment, eight acres were sown with turnip, solely with bone-dust; the soil a light, sandy loam; the subsoil gravely and sand, coming in some places nearly to the surface, which is very irregular, but in general has a south exposure. This field had been broken up with a crop of oats in 1827, after having been depastured six years principally by sheep. The quantity of bone-dust given was 20 bushels per acre, and cost 2s. 6d. per bushel, or £2 10s. per acre. The turnip crop was so heavy, that, notwithstanding the very light nature of the soil, it was judged advisable to pull one-third for the feeding cattle, two drills pulled, and four left to be eaten on the ground by sheep. The following year, 1829, these eight acres were sown with barley and grass-seeds, and the produce was 57 bolls 1 bushel, or 7 bolls 1 bushel nearly, per acre, of grain, equal in quality to the best in the Dundee market, both in weight and color. Next year, a fair crop of hay for that description of land was cut, about 150 stones an acre; and though I am now convinced that the field should rather have been depastured the first year, yet the pasture was better than it had ever been known before for the two following seasons, 1831 and 1832. It is worthy of remark, as a proof of the efficacy of the bone-manure, that in a small angle of this field, in which I had permitted a cottager to plant potatoes, well dunged, and which, after their removal, was included in one of the flakings of sheep, and had (one might have supposed) thereby had at least equal advantage with the adjacent bone-dust turnip-land, both the barley and grass crops were evidently inferior, and this continued to be observable until the field was again ploughed up. A very bulky crop of oats has been reaped this season, probably upwards of eight bolls per acre, but no part of it is yet thrashed.

Having detailed what may be considered a fair experiment during the whole rotation of the above eight acres, I may add, that turnip raised with bone manure, and fed off with sheep, has now become a regular part of the system on this farm; 15, 20, and, last year 25 acres were fed off, and invariable with the same favorable results, with the prospect of being able to adopt a five-shift rotation, and to continue it without injury to the land. Every person in the least acquainted with the management of a farm, of which a considerable proportion consists of light, dry, sandy loam, at a distance from town-manure, must be aware of the importance of this, from knowing the expense at which such land was formerly kept in a fair state of cultivation; indeed, the prices of corn for some years past would not warrant the necessary outlay, and large tracts of land, capable of producing barley little inferior to that of Norfolk, must speedily have been converted into sheep pasture, but for the introduction of bone manure.

Note.—For the last four years, 25 bushels of bone-dust have been given to the acre: the price this year was 3s. per bushel, or £2 15s. per acre.

[The foregoing article places in a striking point of view, the value of a kind of manure which is entirely neglected in Virginia, and used no where (we believe) in the United States, except near the city of New York, and there to a very limited extent. Two individuals are there engaged in pulverising bones for sale—but though the price of the prepared article is much lower than in England, there is not sufficient demand for what the mills have pounded, and a large quantity recently was about to be exported to England for a market.

Many farmers would try the use of bones if they could be pounded by their own laborers: but this cannot be done (as yet) with economy, and the owners of mills in and near our towns, have not thought of entering into the business. Yet there can be no doubt of the profit to all the parties, if some one having proper facilities for procuring the bones in sufficient quan-

tities, and for pounding them, would commence the business, and intelligent and improving farmers would buy the new manure. The prices in England have been regulated by long and accurate trial of the effects of the manure—and farmers have been thereby convinced that they can afford to give prices varying between fifty and sixty-six cents the bushel. Here they might be profitably prepared by millers at half that cost—and therefore might be applied with double profit by the purchaser. We hope that some one of the owners of the great flour mills in Richmond or Petersburg, whose machinery and water power are almost without employment for the greater part of the year, will make a trial of crushing and grinding bones for sale, and that their neighbors, the "town farmers," will take care that the want of purchasers shall not cause loss to the enterprise, or put a stop to the work before a full and fair trial of the effects of the manure.]

ON WATER FURROWING.

To the Editor of the Farmers' Register.

Goochland, July 31st, 1834.

Believing the agriculturist's to be the basis upon which the prosperity of every other avocation depends, and feeling well assured that your invaluable paper happily comports with its design, of sustaining the interest of the farmer, I have presumed to transmit to you a few, though very imperfect thoughts, relative to one out of the many interesting topics, which require consideration. This being a day peculiarly noted for energy and activity, I believe it to be the imperative duty of every man who is a friend to his country and to mankind, to contribute his mite, however small, if it can have a tendency to promote the interests of his fellow men.

It must be apparent to the least minute observer that the present dilapidated aspect of our country must be ascribed to the pernicious system practised by our forefathers, viz: that of ploughing and tilling their crops up and down the hills. I believe our lands, especially of the upper country, sustain more injury from washing than from any other cause. If so, it should be a primary object with the farmers to adopt a plan, which will prevent the surface of his hills from gliding into the bottom, thereby impoverishing the former, while the latter would be furnished with more than can be digested.

As a remedy I would recommend the trenching or furrowing system, which though simple, is powerful in its effects. From experience and observation, I am well satisfied that if they are judiciously run, the soil on our hills may retain its primitive location. I would recommend that they be run with as little descent as will carry off the water, and at the same time preserve them unbroken. I would have them made immediately after ploughing, so as to insure the land to sustain no injury. Their number should be multiplied in proportion to the declivity of the hill on which they are made. As a straight line is the nearest distance between two points, and as water generally manifests a disposition to take a straight direction, which is very different from the one I would have it go, I would always have a hand to visit my wheat field after each rain, for the first two or three after the wheat is seeded, and observe the disposition the water has in each furrow to follow the prescribed channel, and if a disposition to digress is seen, he should lay before it inducements, or put such barriers in its way, as that the desired course shall be necessarily followed. Thus our hills would not only improve in fertility, but our flats would be secured from the continued deluge of red *lava*, if I may so call it from its tendency to overspread with barrenness the most fruitful soils. I would also state, as perhaps I should have done before, that we should exercise some ingenuity in the laying off of our corn and tobacco rows, which should be done in such a way as that each row shall take off its own water, and thereby rendering the separate burden of each one light. In case that they should fail to comply with the proposed end, I would introduce a few furrows, and cause the ploughman to be very careful to preserve them, and if filled up by him, make it a rule that the hoes remedy all defects.

Thus our hill-sides would not only occupy a useful space on our farms, but by this and other improvements, equally essential in their places, such as restricting our stock from grazing only a specified portion of our farms, (and I would here say the fewer the number the better;) by clover, by manuring from our farm pens, &c., they would soon possess the attraction of cohesion, and vie in point of luxuriance with our most fertile plains: which would enable us to transmit to our posterity, estates capable of rewarding industrious, enterprising, and economical habits—and secure them from that rambling impulse, which is doubtless excited to a considerable extent, by the distressing appearance which our once fertile, but in many places, now exhausted farms exhibit.

R. D. KEY.

PRESERVATION OF TIMBER.

From the Genesee Farmer.

The season of the year being one in which fencing occupies the attention of the farmer, has led to several articles in your valuable paper on the subject, with various suggestions for the preservation of posts, &c. Some are for pickling, some for burning, some for lime, and then again ashes are recommended, while others are for turning them bottom upwards. Elsewhere, regard to the quartering of the moon is gravely insisted on, and even a horse shoe nailed on the bottom is by some held to be a specific against decay. How is it that perhaps the ***most important*** and ***valuable*** communication that has appeared in the Genesee Farmer, or any other agricultural paper, has not superseded all these recommendations for preserving timber? Why not give their attention to the really scientific and almost conclusive experiments of Mr. Kyan? It would seem as though that valuable and interesting article, selected for your paper under the signature B., had passed unread or without the consideration due to it, coming as it does supported by the result of five years' experiment. It would seem so, because it has excited no further notice nor inquiry in relation to it! and I fear it has given rise to no experiments, or I think some more particular information would have been called for by the practical farmer. Under this impression—not having the paper within my reach containing B.'s extracts—I will again ask

the practical man's attention to a few facts in relation to Mr. Kyan's discoveries, as detailed in a lecture delivered by Professor Faraday, at the Royal Institution, London, in Feb., 1833.

Corrosive sublimate had long been known to possess an anti-destructive property; and a gentleman, reflecting on this property, proposed to apply it to timber for the prevention of dry-rot—that is, cases of decay whether arising from one cause or another, and no matter how shown. Mr. Kyan's conviction of its efficacy became such, that he laid the subject before the Admiralty, who required nothing less than the test of the "Fungus Pits" at Woolwich, to prove the soundness of the application. Submitted to this for two or three years, the Admiralty advised Mr. Kyan to take out a patent, and are still engaged in watching the progress and results of the severest trials which have been suggested since that time. A solution of corrosive sublimate is made, and the timber or other substance to be preserved is saturated with the solution—this being done, it is dried, and said to be prepared.

This lecturer then said that, "besides the application of corrosive sublimate to timber, it has been applied to various fabrics not composed of wood, as for instance, canvass, cotton, tows, and hemp, to prevent their decay. Before him were some of the pieces submitted to trial by order of the Admiralty three years ago in the "Fungus Pits" at Woolwich, which he (Prof. Faraday) went the other day to see opened. * * * * * * * * One specimen was a piece of timber which came out at the end of three years as sound as it went in! but the unprepared timber had decayed up to the very joints. No part of it had been left. It had decayed and become rotten throughout, but the piece before them was left whole and sound, and fit for the construction of vessels. Last week he saw a large cube of wood which had been there first for three years; it was taken out and examined, and put in for two years more, altogether making *five years*. That cube of wood was again taken and examined by him on Tuesday (the 19th Feb.;) it was perfectly hard and sound. There was no sign of decay in that wood which had been submitted to the rotting action for five years, nor of that destruction which seems to have come on so soon in the same pit with other pieces of wood."

The Professor also stated that —— —— had some prepared, and unprepared posts, placed in the most destructive situation, exposed to the same actions. After a certain time, the unprepared posts decayed, the others still stand preserved by the power of the solution.

Experiments made on cotton and canvass gave the same results; speaking of prepared and unprepared calico, Prof. Faraday remarked, "one was as it went in, but the other was the calico corresponding to it which had rotted and decayed. It was not possible to unfold without destroying it, yet it had been similarly exposed as the other."

This able and investigating chemist then confesses himself "perfectly satisfied of the preservative effects of corrosive sublimate," but still he had some distrust as to its application, lest the effect might be merely temporary, and that after a *certain* time fermentation might again be brought on and decay ensue. But from these doubts he was relieved by a course of experiments that satisfied him—for he found that a chemical combination took place between the corrosive sublimate and the body to be preserved, and that it prevents the destructive power going on, by combining and forming a new chemical compound with the albuminous matter of the wood. "He had before him by way of illustration, a solution of corrosive sublimate, which would prove that the juices, or rather substances, remaining from the juices, in the fibres of the plant, were easy of combination; and if a stem or branch of a tree were cut, the branch allowed to bleed and the sap made to flow into a solution of the corrosive sublimate, combination did take place.

Professor Faraday found that no part of the properties of the corrosive sublimate were subdued, and in fact the substance was not in that state in which it could be volatilized, or removed at ordinary temperatures. Calico was washed repeatedly and thoroughly in water, for he considered if the properties of the application would resist the effects of water in calico, it assuredly would do so in timber. The prepared piece of calico, with an unprepared piece, thus washed, were laid on a board and placed in the cellar, and in due time were examined, when it was found that the latter was covered with a coat of fungus nearly half an inch thick, and the prepared calico was quite free from it." Afterwards, the mercury *was* separated by nitric acid, showing that it had been in combination. This able investigator then adds, "I think the improvement so great as fully to justify its extensive application."

This is a subject, it seems to me, of great general interest, not only to the farmer, but to every individual, and of great importance to all those who work in wood, not only as a security against decay, but as the most perfect mode of seasoning timber for the use of cabinet makers, carpenters, and others, in as much as mahogany and the most compact woods may be seasoned with the greatest certainty and perfection in the short space of two months! It is also an effectual protection against the destructive ravages of insects of every description. But, sir, to return to the more immediate interest of the farmer in these experiments, it will, if the application of so simple a preparation should prove permanently protective, give a usefulness and value to timber that is now only used in our stoves and fire places, making it applicable to all the purposes of building, and a sufficient substitute for the more expensive kinds in the form of posts, rails, fences, gates, hop poles, felloes, spokes, shafts, &c. &c. &c. It will also give durability to our cart covers, rick cloths, bags, &c. &c.; and is an easy defence against moths in carriage linings and other woolen articles, where it can be safely used, for it is a poison.

In the several publications sent me on the subject, I no where found the required strength of the solution, which I have since ascertained to be one pound of corrosive sublimate to five gallons of water. Of this a pine board will take up its quantum in forty-eight hours, in the proportion of about five ounces of the solution to every 216 cubical inches—thus to prepare a post six inches square, that was to be set in the ground two feet six inches, there would be a consumption of about twenty-five to thirty ounces of the solution.

I would suggest sinking a vat or tank in the ground, well set in clay, and made of plank about

three feet deep, and of a length that may be most convenient. Filling this tank with the solution, the posts to be prepared may be set upon the ends intended to be put into the ground, until they have imbibed their quantity, and then removing them let them be replaced by others, and so on. It will be necessary that the tank should stand under cover from rain, and prudence will at once suggest the propriety of having it under lock and key.

Perhaps B. has already commenced the preparation of timber upon Mr. Kyan's plan; if so, we shall probably have some useful information from his pen, as to the best and least expensive way of preparation, with its actual cost in this country. Or the New York State Agricultural Society may think well of causing a series of experiments to be instituted and reported through their own useful little paper, "The Cultivator."

Could I have lain my hand on the extracts on this subject, which have already appeared in your paper, but which I believe are in one of the numbers of the third volume, now at the binders, I probably should not have been led into so much repetition. You will, however, prune and curtail my long communication to suit your own convenience and the patience of your readers.

R.

Maple Grove, April 25, 1834.

ASHES ON FARM YARD LITTER.

To the Editor of the Farmers' Register.

I am pleased at the many communications made in the Register, upon the subject of manures, than which there is nothing more important. From a little attention, I now manure two acres for one. My farm pen manure, composed of stalks, straw, leaves, &c., imparted very little fertility to the land, from the cattle dropping their excrement under their shelters, and very sparsely mixed with the litter of the pen. I have found it advantageous, (and from the present appearance of my corn, admitted by my neighbors,) that by putting a few cart loads of ashes on my farm pen as the litter increases, the difference is scarcely perceptible in the corn on land manured from the farm pen and that from the stable.

S.

THE CICADA SEPTEMDECEM OR, "SEVENTEEN YEARS LOCUST."

From the New England Farmer.

Mr. Fessenden—Much alarm has been created among those whose reliance for a livelihood is on the fruits of the earth, by the annunciation that the land is this year to be overspread with locusts. Many stories of the devastations committed by this fifth plague of Pharaoh have been collected and circulated; and it is doubtless impressed on the minds of multitudes, that we are, in reality, about to see this direful scourge of the east—that the earth is to be covered and the land darkened, and every herb of the land and all the fruit of the trees is to be eaten, and that no green thing is to remain in the trees or in the herb of the field. All this honest misrepresentation and consequent panic, only shows how much there is in a name. For these stories are in no important particular applicable to our insect. At your request, therefore, I offer the following, as the best account I can give of them. And why does not the entomologist do as great a service to the public, by being able to dissipate their groundless fears, as the astronomer, who by his labors, has taught us the cause, period and harmless nature of an eclipse, a phenomenon which is still regarded by the untaught savage with consternation.

The truth is, our locust is not a *locust*—it belongs to an entirely different order of insects. Its history, so far as I have been able to collect it is as follows.—It belongs to the genus CICADA of the order *Hemiptera*, section *Homoptera*. Some of the CICADIADÆ have long been celebrated for their musical powers; so much so, that a portion of them have been grouped together and distinguished by the name of *Cantatrices*, or singers. Their music, which is peculiar to the males, is not produced by the mouth, but by a musical instrument, something like a kettle drum in construction, situated under the chest and covered by two large scales or plates. They live on trees and shrubs, the juices of which they suck. For this purpose they are provided with a long, pointed tube, composed of several distinct pieces, which they fold underneath them when not in use. From the perforations which some of them make in a species of ash *(Ornus)* exudes the substance so well known to us under the name of manna. The female is provided with an ovipositor or auger, of a horny substance, about a third of an inch in length, usually resting in a sheath or groove in the body. This is composed of three pieces, two of which are spear-pointed and finely indented at the end with teeth like a rasp. With this she perforates obliquely the solid substance of the small twigs, and then forming the three pieces into a tube, conveys her eggs through it into the opening. Having filled this with eggs, she moves a little, either along the limb or directly sideways, and performs the same operation until she has deposited all her eggs, which usually amount to from 500 to 700. The eggs are long, white and shining, and somewhat resemble herd's grass seed. The perforations are marked by little elevations, caused by small splinters fixed at one end and detached at the other, thus serving as a lid or valve to the opening; and they look as if they might have been produced by shot, driven in at an angle of 45°. Virgil supposed that these grooves were actually caused by the bursting of the very shrubs from the loud and querulous music of the insect. They usually select dry twigs for this purpose, probably because the moisture of a green one would prove injurious to their eggs; and in the case of the seventeen year species, the shrub oak is most frequently sought. When the eggs are hatched, the young larvæ immediately enter the earth, which they reach either by travelling down the tree, or according to some, by the dropping of the dead twig to the ground before they are hatched. In the earth they remain in a nymph state till the seventeenth summer, from which circumstance they receive their specific name, *Cicada septemdecem.* Of their developement or mode of life in this state, little, if any thing, is known, though a course of observations is now in process from which we may hope to learn something, if the observers should be permitted to live out this insect's term of life. Probably, however, they are rather useful than injurious, by keeping down a superabundant growth of herbage.

Dr. Shurtleff, in a preceding number of your paper, by comparing the records of the appearance of the *C. septemdecem*, thinks there must be some mistake as to their period of appearance. This discrepancy is easily and satisfactorily removed. It is the same as to say that because calves may be born every month in the year, the period of gestation for the cow cannot be nine months. The seventeen year Cicada is in fact seen every year in *some part* of our land, and perhaps nearly every year in the same place, in small numbers. In 1831 I received specimens of it from Sandwich, Mass., in 1832 from Genesee County, N. Y., in 1833 from Martha's Vineyard, and this year they are abundant in various parts of our land, especially at the south. Thus it will be readily seen how the same family or swarm shall appear and propagate only once in seventeen years, while members of other families may exhibit themselves at any time in the intermediate period.

There are several species of Cicada among us, to be found every year, but none of them in such vast numbers as to conceal the foliage and bend or even break down the branches on which they lodge, as does this species. Among them are the *C. pruinosa*, the most common, and the *C. tibicen*, which last measure two and a half or three inches in length, and it is said that the noise of a single individual is such that it may be heard a mile. The *C. septemdecem* may be distinguished from all the others in our land by its smaller size, being about an inch long, its black body, and the eyes and nervures of the wings, usually of the color of brick dust or sealing wax.

As to their inclination or ability to do harm, these are both very small. What they do while under ground, as before observed, we know not. While among us, their only object seems to be, to pair, and deposite their eggs. For this purpose they live a merry day or two, subsisting on a few drops of sap, and stunning our ears with their noisy din, and then become a plentiful source of sustenance to many birds and beasts. It is said that the American savages have sometimes used them for food, but I am not aware that they are ever employed as such by civilized man. It is also said that life has been destroyed by them.—We can easily conceive them to have the power of inflicting severe wounds when confined in a hat or otherwise, by their powerful ovipositors, and these wounds may even prove fatal. But, on the whole, the Cicada is quite as harmless, and far less annoying than the musquito. Its deafening din is far more tolerable than the shrill and quiet hum of the latter, and its hydraulic apparatus consumes a far less vital portion of our precious substance, than the sanguinary lance of the musquito.

A short comparison of the Cicada with the true locust (*Gryllus*) will at once show the difference between the two insects, and the little reason there is to be alarmed at its appearance. The locust belongs to the order ORTHOPTERA, the cicada to the order HEMIPTERA. The form of the locust and its habits are the same as our grasshoppers, which are, indeed, our locusts:—that of the cicada, as is well known, is very different. The two grand differences, however, are, that the locust attains its whole growth above ground; and that, too, in the space of a month or two, and consequently requires a large amount of herbage to maintain its growth. While the cicada has obtained its full size and developement when it first emerges from the ground, and requires little or nothing to support it during the few days of its existence. And again; the locust is furnished with powerful jaws for masticating his food, while the cicada has only a tube for taking in fluids, and is utterly incapable of devouring any thing. Apologizing for this long communication, I remain,

Yours, &c.

AUGUSTUS A. GOULD.

July 3d, 1834.

CULTURE OF CUCUMBERS.

From the Genesee Farmer.

It was not until a few days past that I received the 18th No. of the Genesee Farmer, in which there is a very interesting communication on the culture of melons. I design now only to say a few words respecting the advantages of using straw in trenches according to the recommendation of Judge Buel—a suggestion with which I was equally pleased with D. T.—and these simply in reference to the raising of cucumbers. My object however is to draw the conclusion that similar results may be attained by a like preparation for any other vines belonging to the same natural family.

Cucumbers are very difficult to grow in our gardens to any extent, in this part of the country. As soon as the vines arrive at a bearing state, and produce a scanty supply, they begin to sink under the effort and speedily become exhausted. It is only in low moist places that we can raise them plentifully.

Early in the spring I had a small piece of ground prepared in my garden, by digging a trench about twelve inches wide and as many deep; and not more than thirty feet in length—in the bottom of which fresh straw was laid and made compact to the depth of two or three inches. The earth was then replaced, raising it high enough to form a gentle ridge. Thirteen vines survived the injuries of the frost and insects, and the product of these was indeed extraordinary. I can safely say that we gathered *several bushels* of cucumbers from them. They began to bear early, continued to grow luxuriantly for a length of time; and have at last only given way beneath the intense fervor of the dog days.

My object as I have stated, in detailing the successful result of this trial, is to show that the same preparation will doubtless be well adapted to the growth of melons. The quality of the melons will probably be also rendered more delicious than by the free use of manure—a practice which however it may increase the number, must always materially impair the excellence of a fruit of such delicate and exquisite flavor.

In making these remarks, it is far from my intention to detract from the merits of the other modes recommended by D. T. *They* are at least highly valuable, inasmuch as they will insure an abundant supply of melons at an earlier period of the season. The mode I have detailed may be a useful auxiliary in contributing to a succession.

T. S. P.

Beaverdam, Va. 8mo. 20th.

ON THE REVERSION OF WHEAT INTO GRASS.

By Mr. Main, Chelsea.

From the Quarterly Journal of Agriculture.

I beg to offer a few remarks on the "Reversion of wheat into grass" as stated in a paper* by Mr. W. Blackadder in the December Number of your Journal. Mr. Blackadder's supposition is not new. If I mistake not, one of the earliest writers on agriculture,—Columella or Pliny, I forget which,—conceived that the original type of our cultivated wheat was the *Bromus mollis*, soft broom-grass; and I have met with an old farmer in the county of Hertford, who was of opinion, that light winnowings of wheat if used for seed, become changed into ray *(Bromus secalinus)* and darnel *(Lolium temulentum.)*

That there should be various opinions respecting the original type of wheat is not at all wonderful; because, unlike many other cultivated plants, no trace of it in a wild state is any where to be met with—not even in its native country, Egypt. It is perfectly true, that the sorts cultivated in the northern and alpine regions of India, are far inferior to the varieties cultivated in Europe—more, indeed, like rye than wheat. Still, even there, wild wheat is not found. But this, I think, may be easily accounted for. No plant requires the protection of man more than wheat; it is not only *his* "staff of life;" it is equally coveted by every granivorous bird and every grazing beast, whether in its green or in its mature state. It is seldom we see the scattered grains arrive at perfection in our lanes or hedges, and if a plant springs up in the latter situation and comes to maturity, the increase its quickly devoured either by birds or mice. In fact, the protection of the rick-yard, barn, and granery, is absolutely necessary for the preservation of wheat for the use of man. With respect to the opinion of the Hertfordshire farmer, his mistake (as it certainly was) is easily accounted for. If either ray or darnel grew in his wheat—and few crops can be seen entirely free from one or other —their seeds would most likely remain with the lightest portion of the bulk; and if this inferior sample were, through penuriousness, chosen for seed, a great share of the succeeding crop would certainly be ray or darnel, or both; confirming the blind and careless cultivator, that his "swans had become geese." But whether such a transformation, as that of wheat into any of these grasses, can in any way take place is the question.

In viewing the whole vegetable kingdom, we observe genera, species, varieties and subvarieties; the last carried out, in many cases, beyond all appreciable limits. The types of many genera are no more like the varieties obtained from them by high cultivation, than if they were totally distinct and different beings. For instance, the sloe and the magnum-bonum plum; the gean and Knight's black-heart cherry; the crab of the hedge, and the monstrous rennet apple. Among herbs, compare the wild with the drumhead cabbage; the wild with the Altringham carrot; and the perennial ryegrass with Pacey's variety of the same. Botanists enumerate near thirty species of wheat, and some hundreds of varieties; but not one of these can be fixed on as being the type of the summer and winter sorts now in cultivation; both being, in all probability only varieties. Taking into consideration the difference of structure and qualities exemplified in the cultivated varieties alluded to, we only see an *amplification of parts.* In some the roots and stem are enlarged, as asparagus; in others the number and size of foliage and flowers, as cauliflowers and cabbage; some have the integuments of the seeds enlarged, as the apple; others the seeds themselves, as the cob-nut, and the Windsor bean. In all these changes, however, increase of volume is the most striking characteristic of variety. There is no change of *generic character*, or of constitutional organization; and therefore we are led to conclude, that no genus is capable of being transformed into another.

None of the natural orders of plants bear a stronger resemblance to each other than do the 158 genera composing *Gramineæ;* viewing them from the *Bambusa arundinacea*, a tree grass, down to *Aira humilis*, the least hair-grass on Mount Caucasus, a strong likeness runs throughout. Notwithstanding this general similitude, every genus is distinctly marked both physically and botanically; and there appears not the least likelihood that they are amalgable into each other or changeable in any other way than as is remarked above. We have, it is true, instances of vegetable mules, that is, intermediate productions between two species partaking of some semblance of both parents; but these instances are not only extremely rare, but the progeny, like animal mules, are imperfect in reproductive functions, and quickly cease to exist. Florists' mules, obtained by cross impregnation among kindred varieties, show changes of habit or colors only, not changes of generic character.

Applying the foregoing observations to the circumstances detailed by Mr. Blackadder, I would infer, that there has been some mistake in the instances cited. That the *giant-fescue* appeared on the spot where the smutted wheat was deposited, there can be no doubt; but that this grass sprung from *dead* grains of wheat is perplexing. Smutted ears or grains of wheat, barley, or oats, never flower, and consequently cannot be fertile.* The smutted grains of wheat, however, when mixed in the bulk, are nearly of the same size as those of darnel, and might be easily mistaken the one for the other; and thus, I dare say, it has happened in the trials of Messrs Strachan and Bell.

Both the ray and darnel require to be sown in the autumn, in order to their flowering in the following summer. The first yields a heavy crop of seed of excellent quality, relished by every bird and beast; the second has a long spike of large seeds, in flavor as bitter as gall, and in quality intoxicating, and even dangerous if ground in bread corn or mashed in distillers. This is like the *sleepies* mentioned by Mr. Blackadder.

Being at a meeting of the Linnean Society a fortnight ago, I mentioned the circumstances of the "reversion of wheat into grass," to Messrs David and George Don; they both agreed with me in thinking that the seeds of the *fescue* or *brome* had been *unintentionally* sown with the smutted grains of wheat.

* See Farm. Reg. p. 126, Vol. II.

*What is here taken for granted, namely, that smutted grains of wheat never flower, and cannot therefore be fertile, constitutes, we conceive, the very essence of the question "Whether such a transformation can in *any* way take place?"—Editor Jour. Agr.

The *bromus secalinus* spoken of in the foregoing article is what is called by the name of *cheat* in Virginia, and the *lolium temulentum* (or *darnel*) is our *spelt*. Those who believe that either, or both of these plants are the products of wheat, may here see their opinions supported by that of the old Hertfordshire farmer above quoted: but at the same time, they should observe that this opinion is evidently stated as one not entertained by many, if by any other persons—which could not be the case if the supposed change was possible, and a matter of frequent occurrence, as is supposed by many persons here.

As both of what we call cheat and spelt are English weeds, it is strange that we hear nothing of either being very injurious to the wheat crops, as is the case here, and particularly with spelt.

We have reason to believe that spelt has not very long been known in Lower Virginia, and that the seed was first brought from England in the provender of imported English race horses. This opinion is supported by a fact stated by Col. Thomas Emory (in a former volume of the American Farmer,) that this plant was not known on Kent Island, in the Chesapeake, until after some British cavalry had been stationed there during the last war. We should be glad to learn any facts serving to confirm or disprove the supposed recent introduction of spelt into this country. If there was a time, since wheat was generally cultivated, that we were clear of spelt, (or darnel) or if there is any part of the country which is still free from it, these facts alone ought to prove that its origin is not from wheat.

We add below the article from Loudon's Encyclopædia of Plants, on the Grasses, which gives some information of what we call spelt. The author does not notice (if he had ever heard of) its supposed change from wheat. We dissent from his opinion of the harmlessness of the seed as food for man, whatever it may be for beasts. When it has been largely mixed with wheat, we have heard of several well established facts of the bread producing sudden and violent sickness.

GENERAL CHARACTERS OF THE ORDER OF GRASSES [GRAMINEÆ.]

From Loudon's Encyclopædia of Plants.

The order of grasses is beyond doubt the most natural of all that the ingenuity of systematic botanists has contrived; it is also the most numerous in species. The inflorescence is very much alike throughout the order, and the floral envelopes, which are bracteæ in a progressive state to the form of calyx and petals, offer few striking characters by which the genera can be characterized. Hence it is that the classification of the order, and its division into genera, has not only been found extremely difficult, but has given rise to much difference of opinion among botanists; some of whom, adhering to the synthetical arrangement of Linnæus, admit but a small number of genera, while others, admitting the analytical principles of modern science, divide it into a vast number. The middle course in this, as in most other cases, is probably the just one. A subdivision of the order into tribes, has been attempted by Palisot, Trinius, Dumortier, Raspail, Kunth, Link, and others; that of M. Kunth is here adopted.—The general habit of grasses is so familiar to every one, that it may be passed over in silence. They are remarkable for exhibiting, in no case, properties that are actually poisonous; possessing on the contrary, in almost all cases, wholesome and nutritive qualities. These latter are especially obvious in their seeds, which always contain a farinaceous substance, mixed with a certain proportion of glutinous matter. No one is ignorant of the various and important uses of the seeds of wheat, rye, barley, oats, maize, rice, and others, and in general of all the larger kinds of grass. It must however be remarked, that if the smaller sorts are not employed in like manner, it is merely on account of their minuteness, and not on account of any difference in their nature; in fact, in times of scarcity, and in half cultivated countries, use has advantageously been made of Festúca fluítans, Zizánia aquática, Avéna fátua, Pánicum sanguinále, Avéna elátior, Brómus secalínus, and E'lymus arenárius. It is also to be noted, that the particular uses for which the seeds of certain grasses are employed, are not peculiar to them, but may be obtained from all the others, with slight modifications. Thus beer is made, not only from barley but also from wheat; spirituous liquors not only from our European cerealia, but also from rice. But it must be remarked, that a singular exception to the generally wholesome properties of grasses, appears to exist in Lólium temuléntum, the seed of which is reported to be narcotic and inebriating, and even poisonous; there is no doubt, however, that these qualities have been greatly exaggerated; for in the first place they disappear in bread or beer manufactured from Lólium temuléntum; and secondly, in times of scarcity, people have frequently lived upon it. But even supposing all that has been stated upon the subject to be true, this plant will still be found to be little different from wheat, when long exposed to wet; so well, indeed, is this known by country people, that a belief exists, that in wet summers wheat is actually transmuted into rye grass. The exciting properties of the oat, which are very unusual in this order, have been found to reside in the husk and not in the seed, and to depend upon the presence of a minute quantity of an aromatic principle, analogous to Vanílla, lying imbedded in the envelope of the seed, and capable of being extracted by aid of alcohol. As to the deleterious effects of the ergot of rye, these do not depend certainly upon any such property in the rye itself, but is caused either by the ergot disease, or, as is believed, by the parasitic fungus, from the attack of which it arises. Now let us pass from the seeds of Gramineæ to their stems, and we shall find a no less remarkable uniformity of nature in them. They all contain, especially before flowering, a sweet sugary mucilage, which varies in quantity in different species. The sugar cane, in which this is found in greatest abundance, not only constantly exists in the most favorable condition for producing it, as it rarely flowers, but is also one of the largest grasses known. The maize also abounds in sugar; and the same substance is secreted in such abundance by the Sórghum saccharátum, that attempts have actually been made in Italy to cultivate it as the sugar cane.—The creeping roots of grasses, which are generally mucilaginous and demulcent, are sometimes used in medicine; but they are of more importance for retaining in banks the sand of the sea shore, so as to

form artificial cliffs on flat coasts, to restrain the inroads of the sea. The stems of Andropógon schænánthus, the leaves of Andropógon citrátum, the roots of Andropógon nárdus, and the whole plant of all the species of Anthoxánthum, exhale an aromatic odor, and possess slightly tonic properties. To conclude, the epidermis of grasses has been found to contain a considerable quantity of silex.

BAGBY'S THRASHING MACHINE.

To the Editor of the Farmers' Register.

The drum of a wheat thrashing machine has been lately invented, by a citizen of this county, (James Bagby) which for its easiness of draught and strength, and the rapidity and cleanness with which it thrashes wheat, makes it, in my opinion, superior to any I have seen. The cost of this drum is between sixty and seventy dollars, and can be easily attached to the horse power of any other machine. The one I use is propelled by the horse power of an old beating machine, and is easily drawn by four horses.

About a fortnight ago I made an experiment to see with what rapidity it thrashed wheat: the result was fifteen bushels in thirty minutes. No extraordinary exertions were used, except to make the mules by which it was drawn, walk a little faster than their ordinary gait (as my horse power did not give sufficient motion) and having a plenty of wheat ready and applied to the machine to prevent its waiting. Allowing ten working hours to the day, this will make three hundred bushels which this machine is capable of thrashing clean from the straw in that time. I examined the straw after it had passed through the machine, and very little wheat remained: I could find but few grains in a handful of straw. The wheat thrashed was the red shuck, a smooth headed red wheat of good quality. Another advantage which this machine possesses is, that the wheat and straw pass off in different directions; and its strength and durability are such, that in my opinion, with care it would not require any repairs for twenty years; and its construction is so easily understood, that almost any mechanic could then put it in order.

As all improvements in implements of husbandry are of great importance to a farming community, I concluded the public would be benefited by making this machine known through the Farmers' Register.

RICHARD G. MORRIS.

Buckingham, Aug. 26, 1834,

REPORTS OF THE SEASON AND STATE OF CROPS.

Through all August drought was severely felt in Lower and Middle Virginia, and part of North Carolina: how much further correct information does not yet enable us to say. Some crops of corn were favored by abundant showers in time to save them: but these favors were partial and few—and in general, the crop of Lower and Middle Virginia has been greatly injured. The long drought ended September 1st, when a spell of rain commenced, but which was too late to benefit any corn, except the few replanted, or otherwise very late and immature stalks. The crop must be short of an average. In some neighborhoods where the suffering has been less, it is expected that the crop will be equal to that of last year. The price throughout the year has been higher than usual—varying between $3 and $3 75 in Petersburg—and higher in the southern counties, which have received part of their supply from Petersburg, by return loads of the wagons which brought their wheat to market.

A freshet of very unusual height is reported to have inundated the rich and extensive lowlands of the Roanoke, early in September. No particulars of this visitation have reached us—but it must have caused great destruction.

The reports of the amount of the wheat crop in Lower Virginia, have varied greatly in different places—but no correspondent has spoken of the quantity being equal to an average, while others have counted the crop of their neighborhood not much more than half of an average for the land. The quality of the grain is excellent every where. In the mountain region of Virginia, the crop was very abundant.

The cotton crops of the South were as promising as could be desired previous to the commencement of drought in August: it is not known yet whether any considerable loss has been sustained from that cause.

The drought in Lower Virginia made land generally so hard as to prevent fallowing in August, and that operation will be much more backward than usual—and it may be inferred, less perfectly performed.

The rainy spell of the first week of September, was very destructive to the early gathered corn fodder—and a second spell of showers and cloudy weather which began on the 17th, and has continued with but little intermission to the 24th, will be not less injurious to the latter gathering.

Rockbridge, August 19.

You can do nothing at this time, that will more promote the interest of this, and (as I believe) of every other section of our state, than to urge on the James River and Kenhawa improvement. From last Richmond quotations, wheat is worth 115 to 125 cents, whilst here an article of better quality will only bring 75 cents, and no purchases at that sum for any considerable quantity.

The wheat crop is good, and the quality better than usual. We are now suffering under a very severe drought. The corn crop must be cut short one-third or perhaps one-half. I have cut corn the last of September, and the blades not more injured than they are now on many farms.

New Store, Buckingham, 28th August, 1834.

I see from your Register, accounts from many parts of the country of the present crop. This neighborhood has and is now suffering very much for want of rain: we have had little or none for almost six weeks, and every thing is literally burning up. The fodder in many fields has burnt to the tassel, and corn could be but little benefited by rain now—it might be made heavier, but generally the substance is too far gone. That which was planted in good land early, is very fine; but the common high land will yield nothing. A portion of this county has not suffered much, and

there is many fine crops. Now is a trying time in tobacco, most of which is small; and unless we get rain in a few days, the crop is obliged to be small: and in any event, from what the writer has seen and heard, it will be another short crop. The wheat crop is not likely to yield as was expected; I think it will fall short nearly a third. The oat crop around this place was exceedingly sorry; and I doubt very much, whether taking the whole crop, if it can be any thing like an average one. There is little or no land fallowed in this county, and the season so far advanced there will be but little done at it, notwithstanding this is a great wheat growing county.

ALABAMA LANDS, AND AGRICULTURAL JOURNALS.

To the Editor of the Farmers' Register.

September 3d, 1834.

* * * * I promised you to make some effort to extend the circulation of your journal in Alabama when I saw you last spring on my way thither. I found the erroneous opinion very prevalent in that region, "that their lands were naturally so fertile, that the improving hand of man could impart nought, either to its fertility, or to the retention of its existing richness." But I am very much mistaken, if the opposite be not the truth: their lands are generally broken, and in many places sufficiently undulating, to be seriously injured by washing rains. It is true, they have lands, some cane-brakes and prairies, which, I presume, with a proper system of cultivation, can never be deteriorated—they only require a change to relieve them of a tiresome companion for years. It is a splendid planting country; and I believe, that there are portions of South Alabama, as healthy as any country in the world. The land, except for a short interval, is very dry—and they are blessed with fine *limestone* water. There is so much carbonate of lime in the soil, that if a portion be thrown into vinegar, instant effervesence ensues. It follows, that so soon as dead vegetables fall to the earth, they are decomposed. Pure air sweeps over the land, and as there are no ponds of stagnant water, no marshes, consequently, no miasmatic vapors. Of course, the country must be heathly, and I am surprised that any, who have had a personal inspection of the country, if profit is their object, can remain here. Your great and invaluable efforts will, no doubt, ultimately present a barrier to emigration, for although the advantages may be infinitely superior, yet the disadvantages in breaking up—making immense sacrifices in many instances of property—and of friends, relations, &c., in all cases, are enough to deter one of ordinary firmness from putting the design into execution. My feeble constitution makes it necessary, that I should seek a warmer climate, hence I go to South Alabama. The part with which I am most pleased, is immediately below the mountains, through Green, Marengo, &c. I regret very much to leave old Virginia; but with her are left the fondest wishes, the most ardent prayers of my soul, for her prosperity. I think, that Virginia is waking from her fatal lethargy—a lethargy, which had well nigh annihilated her hopes, and driven her enterprising sons to the "far West." You are destined, I hope, to place her in that position she once occupied, and great will be your reward, in the unfeigned gratitude of thousands unborn. I shall carry with me your paper to the South, and shall make every effort for its extension. I need not say, I derive much gratification from its perusal.

[Some of the warmest friends and supporters of the Farmers' Register, are planters of the rich new lands of the South and West, and they are fully of the opinion that they have each an individual and private, as well as a general and public interest, in the support of the work. But we are aware that such opinions are comparatively rare—and that most of those on new and very fertile soils, hold such opinions as are quoted by our correspondent above, "that no agricultural publication is wanted for those who cultivate soils of such great fertility." This is a mistaken view, in every aspect. It might be easily shown that the sound rules for adding fertility to impoverished soils, would be useful for the preservation of the fertility where it has not yet been lost—and no matter how rich may be the planter's land, nor how low the price at which he can purchase more, it will always be more economical to preserve, than to waste or destroy the fertility of his soil.

But even if all is yielded that is claimed for these erroneous opinions—if it is admitted, to the fullest extent, that the Alabama planters cannot possibly profit by instructions for increasing or retaining fertility in the soil—still there will remain many important matters in which they may receive valuable and profitable instructions, and even from other farmers in remote countries, and cultivating under different circumstances. No matter how rich the soil, its management may be such as to yield a poor return to its owner: and it is as important to the Alabama planter, to economise his scanty supply of high priced labor, as for other farmers to economise and increase their means of fertilizing poorer soils. Information respecting labor saving implements, and labor saving processes in cultivation—of the peculiar qualities and respective value of improved breeds of domestic animals—and of their diseases, and the proper remedies therefor—of the new and more valuable varieties of cultivated plants, and of the causes of, and remedies for, the fatal diseases to which all crops are subject, and which often change, and exhibit increased virulence, or present altogether new appearances and effects. For example—when the *rot* was first extending over the cotton fields of the South, it would have been of great importance for intelligent and observing planters, to have made use of an agricultural journal, as means for exchanging their ideas respecting the new and destructive disease: and if such interchange of opinions and of facts, had not served to point out the remedy, it would at least have saved great expense to many planters in showing the worthlessness of measures which they supposed to be, and were using, at great trouble and cost, as remedies for the rot.

But putting aside all these important considerations, there is another, humble as it may be, that alone will

repay any farmer in Alabama or elsewhere, for his expense in taking an agricultural journal. This is, that through it he may at any time obtain an answer to his inquiries on any particular subject, which probably could not be done without such means, in twenty years, if ever. How much has not every farmer lost at some time, for the want of particular information respecting the value of a new crop, of different varieties of seeds, of new implements, &c.; which loss might have been avoided, if he had known where to seek and obtain the information needed. Every farmer would gain at least as much as his subscription money, by subscribing for, and reading some agricultural paper—and many would thereby gain a hundred fold. And if we are urging the support of our own interest by this advice, (as is readily admitted) we are also, and in a much greater degree, urging the advancement of the interest of others. But the Farmers' Register is not the only agricultural journal in the Southern States, to which the foregoing remarks will apply—and they speak at least as strongly in favor of the support of other journals as of our own. The publication nearest to the farmer, if equally well conducted, will of course be most suitable to his wants and circumstances, and therefore best deserving his subscription.]

TO DESTROY WILD ONIONS.

To the Editor of the Farmers' Register.

One of your correspondents signed J. E. M. makes inquiries through the Register, whether there is any way discovered to destroy wild onions? Believing it may be effected by a simple process, which I accidentally discovered many years ago, I feel it a duty I owe to my fellow agriculturists to make it known. I had a lot near my house, which I usually cultivated in tobacco and wheat alternately, in which there was about one acre so infested with the garlic, or wild onion, that I usually separated the wheat made on that part of the lot, and kept it from the rest. Some thirty years ago, I had prepared this lot for tobacco, but failing in plants, I put it in corn, and cultivated it well until harvest, but did not touch it afterwards. It threw up a heavy crop of crab-grass, and I was compelled to cut the hay off of it before it could be sown in wheat. At the next harvest I was surprised to find all the onions had disappeared, nor has that piece of ground been pestered with them since, and I have this summer taken a crop of early wheat from the same lot. A little reflection convinced me they were smothered by the close and small fibres of the crab-grass.

Some years afterwards I made an experiment on another piece of ground that was infested with the same weed. It was ploughed and harrowed early in the spring, and the next fall it was seeded in wheat, and I discovered at the next harvest the garlic had disappeared: nor have they appeared since—and as my farm has not been much pestered with garlic, I have never had occasion to resort to the same remedy since.

Before I conclude I will make a few observations on the cure and prevention of this pest to so many farmers, in hopes that some one of the fraternity will make the experiment on a larger scale than it has been done by myself. All summer crops increase the evil, for the garlic propagates more from the roots than the seed. Coarse stalk grasses such as clover, will not smother them. Should the land be too poor to produce a heavy crop of crab-grass, it must be manured. Where the onions are as thick set as they are in some parts of the tide-water country, it may be necessary to repeat the process a second time. To prevent their increase, the seed ought to be selected on that part of the farm that is clear of the pest.

ONE OF THE PAY ALLS.

Aug. 20th, 1834.

[At page 580, Vol. I. Farm. Reg. there is a statement of effects very similar to the above, of the destruction of blue grass, by its being smothered under a heavy cover of crab (or crop) grass.]

TO SUBSCRIBERS.

With this number bills will be sent to all subscribers who remain indebted for the *first volume* of the Farmers' Register. This step has been delayed until this time, and is reluctantly taken now, because we know that these duns will reach many who are in arrear merely from inattention to such small matters, and whose payments are as certain, and their patronage as much valued, as of any subscribers we have. To all such, a sufficient apology will be apparent, in the necessity for one uniform rule being adopted for all similar debts, without regard to persons.

We have used every care to give, promptly and correctly, the proper credits for all payments, in the monthly receipt lists published on the covers: and the correction of any error, or omission, has been regularly asked in the standing heading to those receipts. If notwithstanding these precautions, and the means thus furnished to every subscriber to know and correct mistakes, some should still remain on our books, we cannot be justly blamed for their continuance. Our whole course of procedure affords ample evidence of the wish to avoid mistakes, and to correct all previously made. If therefore, bills should be sent to any who have already made payment, we hope that the error will be imputed to any cause but design on our part. In these, as in all cases, we will readily and gladly be corrected, by being better informed.

TO CORRESPONDENTS.

The following communications have been received. "A commentary on the law of Virginia concerning enclosures"—"Queries respecting herds grass and wet lands"—"Rainy day reflections, &c."—"On thrashing machines"—"Calcareous deposites on Piankitank River"—On the improvement of agriculture"—"On the cultivation of fruit trees"—"Directions for making ox-carts, &c."—"Cost of legal fencing, &c."

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